AMERICAN GAS JOURNAL

SEPTEMBER, 1933 Price 25c

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Smithsonian Deposit

NEW Robertshaw design and engineering is ever apace with the industry it serves—this new Model FC Robertshaw combination oven valve and oven control, independently operated, provides a neat and convenient assembly for the new table top and console models

CHECK up all the features of the modern gas range and the one that is most talked about is the oven control . . . the outstanding reason why most women feel justified in buying a new range!

Make sure, then, that your ranges have an oven control worth talking about . . . an oven control that in longtime service will actually do all the things you claim for it!

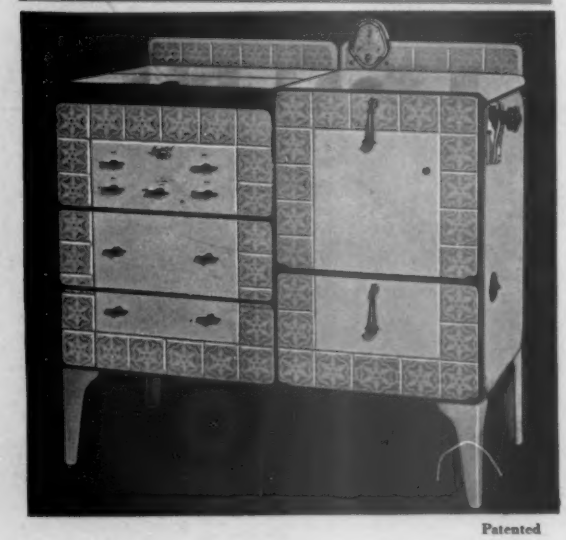
That means nothing less than a genuine Robertshaw AutomatiCook . . the acknowledged standard of the entire gas range industry, since the great majority of all gas range makers provide the Robertshaw as standard equipment.

THE ROBERTSHAW THERMOSTAT COMPANY
Youngwood, Pa.

ROBERTSHAW "Automati-Cook"

Magic Chef

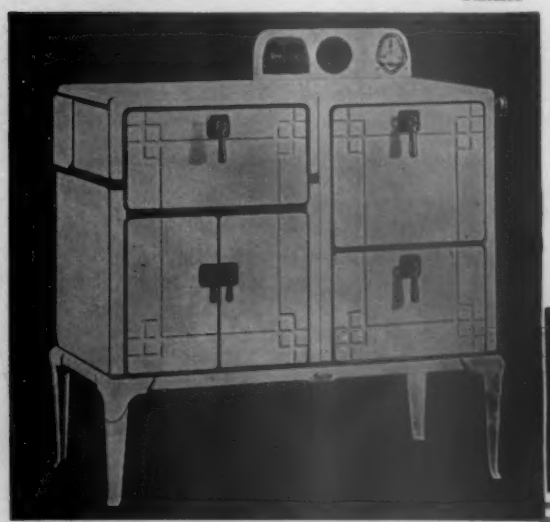
AMERICAN STOVE COMPANY



Patented

Look for the RED WHEEL
When you buy a MAGIC CHEF

Patented



A COMPLETE LINE

..that meets today's buying needs

WITH the buying swing gaining momentum daily, the Magic Chef line offers an unusual opportunity to gas range retailers. Magic Chef is a completely balanced line of related models that meets every buying requirement of size, style, taste and price.

To further strengthen the retailer's position, the Magic Chef line has advanced features of efficiency, convenience and economy found in no other gas range.

These features include the ingenious Magic Chef top burner which gives a thousand even heats . . . the Magic Chef Automatic Top Burner Lighter which lights any top burner automatically when the gas is turned on . . . the Sanitary High Burner Tray which conceals and protects pipes and valves . . . the famous Red Wheel Lorain Oven Regulator . . . the Grid-Pan Broiler, two-piece, with special basting reservoir... Automatic Time Control Clock.

Added to these advantages the Magic Chef retailer shares the benefits of extensive national advertising and the sales-winning prestige of Magic Chef at a "Century of Progress" Exposition. Representing the industry, American Stove Company was chosen to show an exhibit of the development of gas cooking appliances. Besides this exhibit, 5 out of 8 model homes at the Exposition are Magic Chef equipped.

AMERICAN STOVE COMPANY

World's Largest Manufacturer of Gas Ranges

BOSTON · · · · NEW YORK · · · · PHILADELPHIA
ATLANTA · · · · CLEVELAND · · · · CHICAGO
ST. LOUIS · · · · LOS ANGELES · · · · SAN FRANCISCO

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September 1933

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WE DO OUR PART

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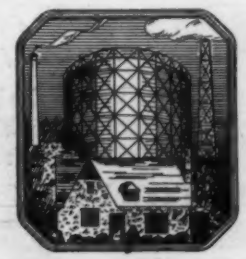

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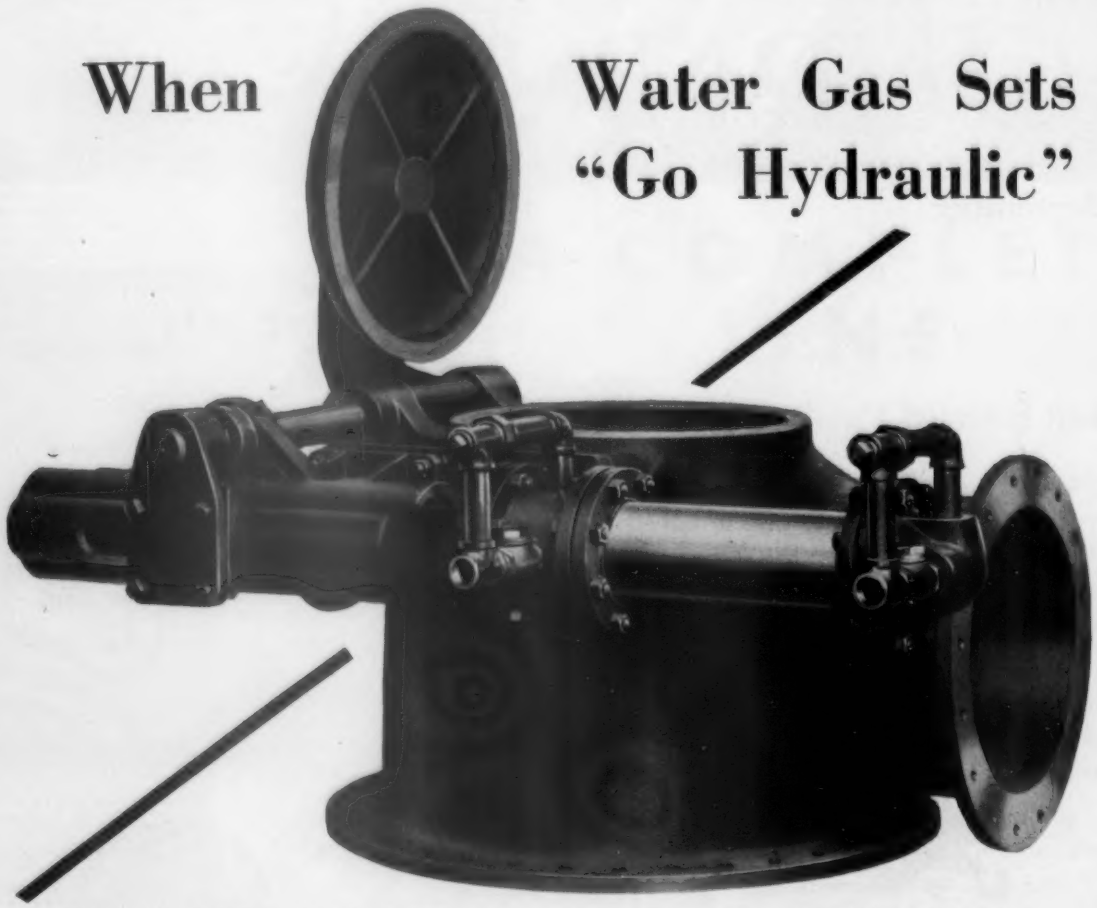
NUMBER 3717

When Water Gas Sets "Go Hydraulic"



They Need This New Stack Valve

THIS SEMET-SOLVAY SUPERHEATER STACK VALVE is built for hand operated water gas machines that are to be changed over to hydraulic control. It is also being installed in hydraulic plants for its ability to speed up the gas making cycle.

NOTE THESE FEATURES:

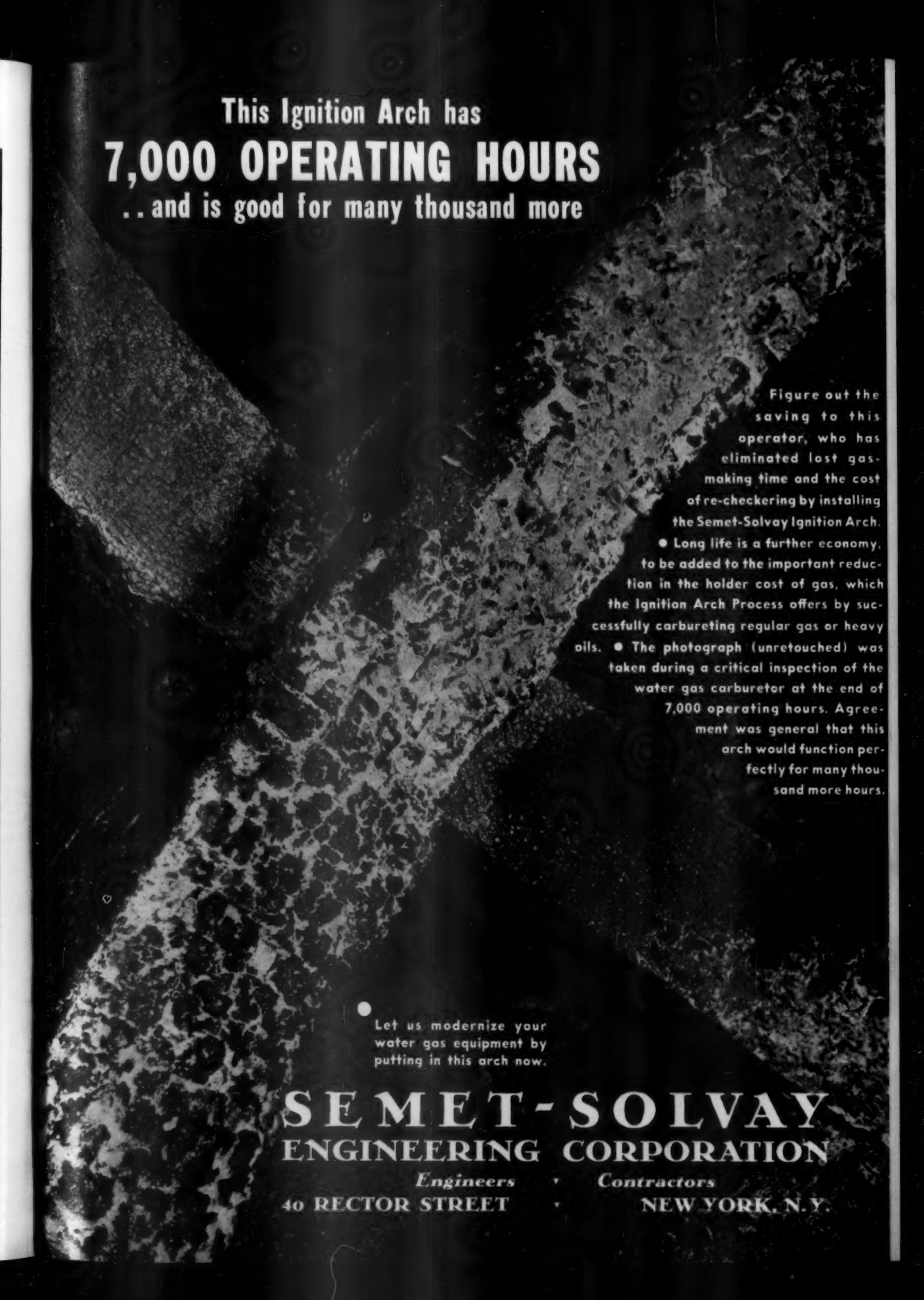
A combination stack valve and tee in one unit.
Gas tight seating by hydraulic pressure prevents leakage.
May be equipped with an auxiliary purge valve if desired.
Adaptable to existing clearances; will fit any superheater.
Completely built and tested in our shops, and shipped ready to bolt on the superheater.
Can be opened or closed in less than four seconds, thereby speeding up the operating cycle.

We are ready to furnish one for each of your machines.

SEMET-SOLVAY
ENGINEERING CORPORATION

Engineers • ***Contractors***

40 RECTOR STREET • **NEW YORK, N.Y.**


This Ignition Arch has
7,000 OPERATING HOURS
..and is good for many thousand more
Figure out the saving to this operator, who has eliminated lost gas-making time and the cost of re-checkering by installing the Semet-Solvay Ignition Arch. • Long life is a further economy, to be added to the important reduction in the holder cost of gas, which the Ignition Arch Process offers by successfully carbureting regular gas or heavy oils. • The photograph (unretouched) was taken during a critical inspection of the water gas carburetor at the end of 7,000 operating hours. Agreement was general that this arch would function perfectly for many thousand more hours.
Let us modernize your water gas equipment by putting in this arch now.
SEMET-SOLVAY
ENGINEERING CORPORATION
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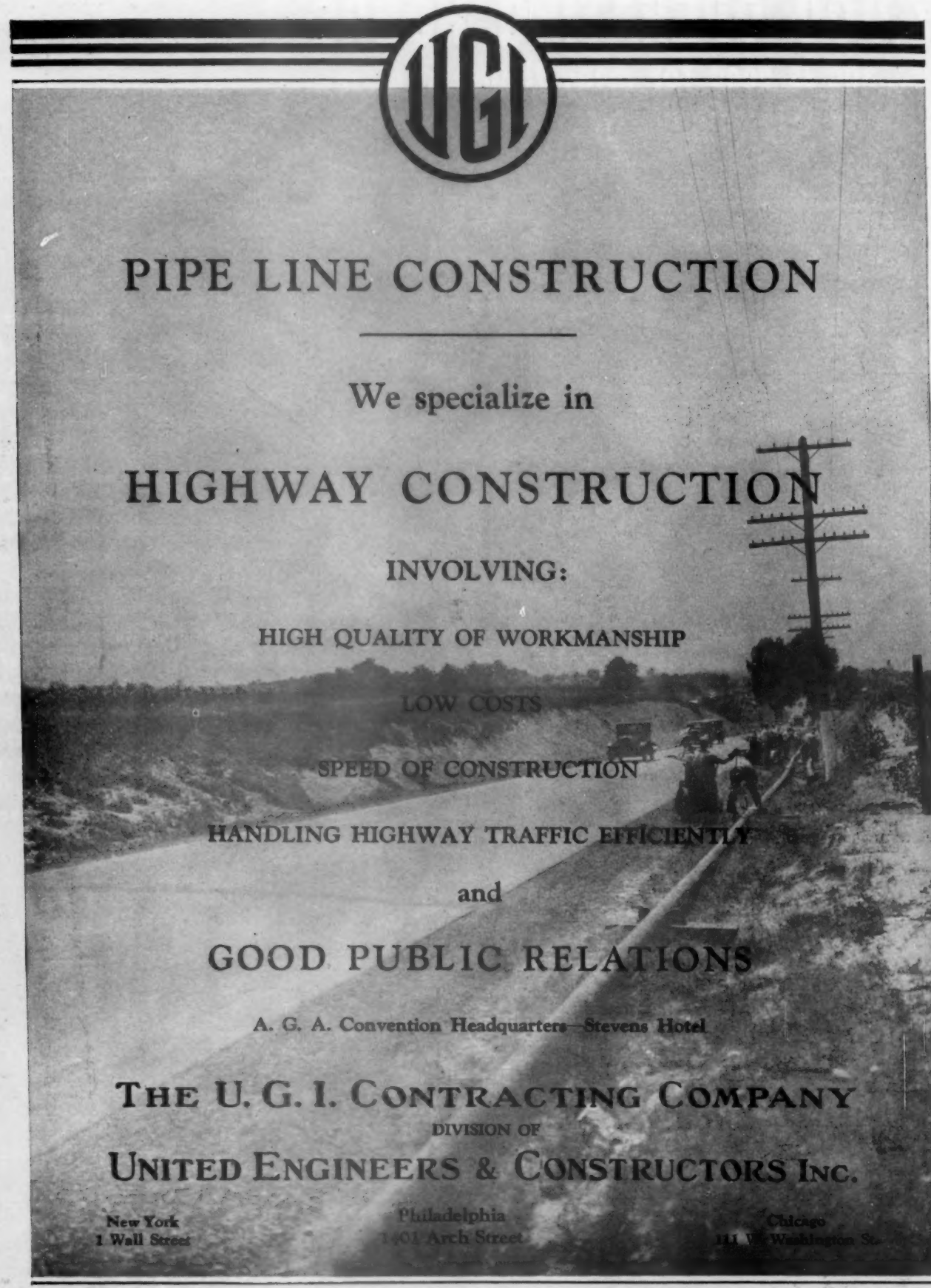
40 RECTOR STREET • NEW YORK, N.Y.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PIPE LINE CONSTRUCTION
We specialize in
HIGHWAY CONSTRUCTION
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HIGH QUALITY OF WORKMANSHIP
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HANDLING HIGHWAY TRAFFIC EFFICIENTLY
and
GOOD PUBLIC RELATIONS
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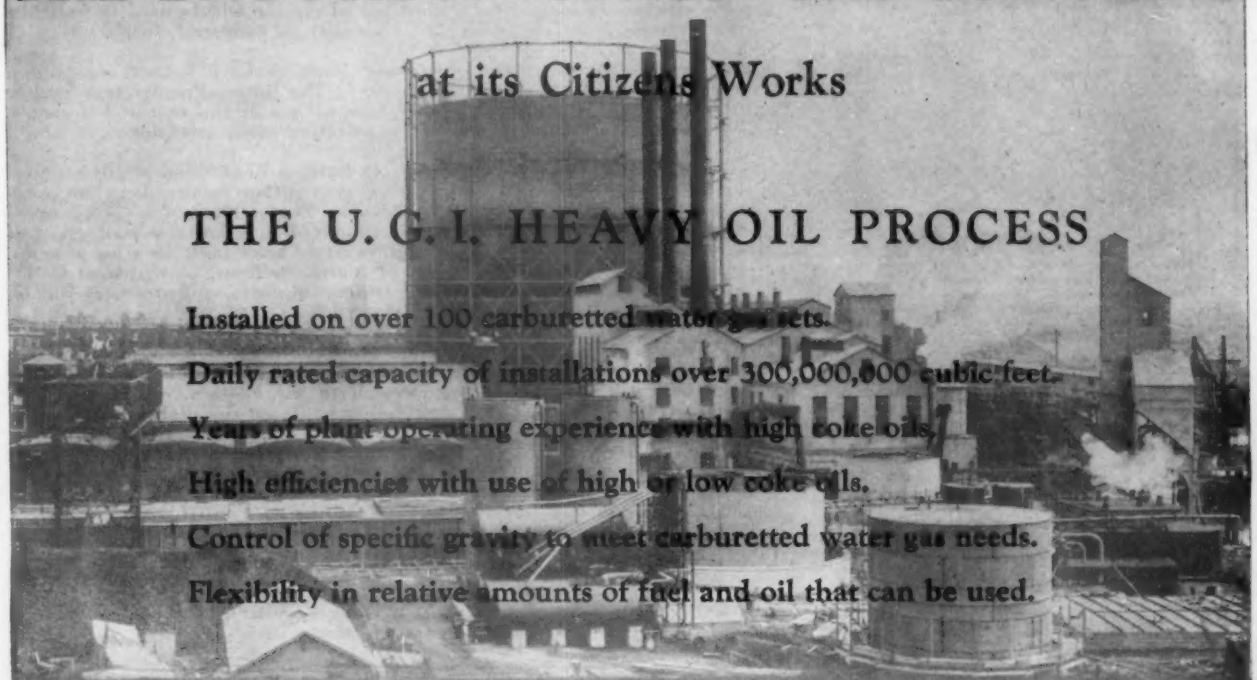
MAXIMUM RETURN TO CLIENTS PER DOLLAR EXPENDED

THE U. G. I. HEAVY OIL PROCESS

Now in use by

THE BROOKLYN UNION GAS COMPANY

at its Citizens Works



THE U. G. I. HEAVY OIL PROCESS

Installed on over 100 carburetted water gas sets.

Daily rated capacity of installations over 300,000,000 cubic feet.

Years of plant operating experience with high coke oils.

High efficiencies with use of high or low coke oils.

Control of specific gravity to meet carburetted water gas needs.

Flexibility in relative amounts of fuel and oil that can be used.

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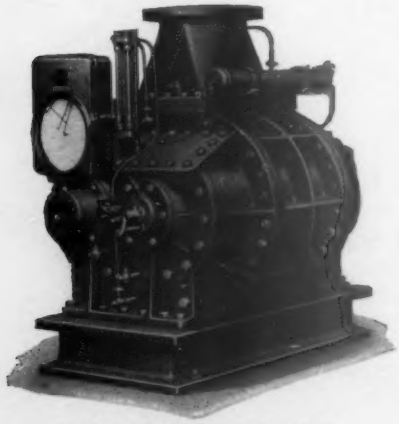
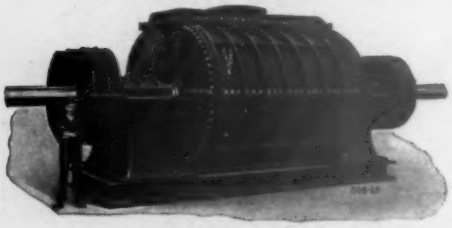
MAXIMUM RETURN TO CLIENTS PER DOLLAR EXPENDED

MORE THAN A CENTURY OF SERVICE TO THE GAS INDUSTRY



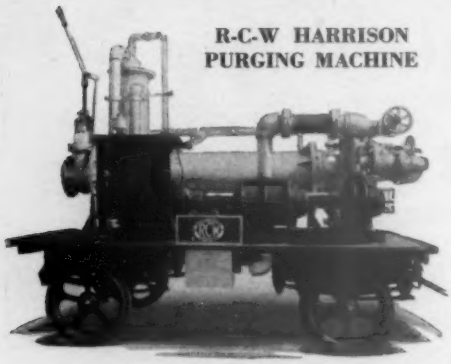
CONNERSVILLE METERS

Fig. 1: High-pressure Meter of medium capacity with P.V.T.T. Recorder is shown. Connersville Meters are built in the high-pressure type for maximum peak line pressures up to 75 lbs. Bulletin 40-B10.



EXHAUSTERS AND BOOSTERS

Fig. 2: Heavy-duty Gas Pump of larger size. R-C-W Gas Pumps are offered in a wide range of sizes and pressures, and are suitable for either Booster or Exhauster service. Heavy-duty Compressors for handling gas range up to 50,000 cu. ft. per min. at pressures up to 30 lbs. Bulletin 23:33-B10.



R-C-W HARRISON PURGING MACHINE

Fig. 3: R-C-W Harrison Purging Machine capable of producing 35,000 cu. ft. of inerts per hr., at 60°F., against 2 lbs. discharge pressure. Other capacities and pressures can be arranged. Bulletin 100-B10.

COLLECTIVELY, the Roots, Connersville, and Wilbraham companies have been serving the Gas Industry for more than a century with a variety of products, some of which are shown.

But the important question to the industry is: not how long, but how well? This can best be judged by the wide acceptance accorded to R-C-W products, and by records available which reveal exceptional efficiency and reliability, over extended periods of years.

Connersville Meters **are recognized for their extreme accuracy, their rugged construction, and their economy of space. Measuring chambers are bounded by accurately machined cast iron surfaces which can not be altered in the field, thus assuring permanent accuracy. Built in a wide range of sizes and types, they are readily adaptable to nearly every process of manufacture and distribution. They are widely used in both the manufactured and natural fields, especially on industrial loads.**

R-C-W Gas Pumps, Exhausters, and Boosters **have gained recognition because of their reliability and economy. The Rotary Positive type assures the delivery of a predetermined volume of gas at the required pressure, or vacuum, regardless of variations affecting other equipment.**

R-C-W Harrison Purging Machines **are built to produce inert gas containing less than 1% oxygen, and zero per cent carbon monoxide, when operating from natural or manufactured gas. The services of a skilled operator are not required. Inert gas is produced at a lower overall cost per thousand cubic feet. These machines have been built in sizes ranging from 12,000 to 40,000 cubic feet of inerts per hour, measured at 60°F., against 2 lbs. discharge pressure. Other capacities and pressures can be arranged to suit special operating conditions.**

Bulletins are available on all of the products mentioned above, as well as on Rotary Positive Blowers and Cycloidal Pumps, which are also used by the Industry. Your request addressed to the Factory, or nearest sales office, will have immediate attention—and without the slightest obligation.

In addition to our Rotary Positive equipment, we are also offering a complete line of Centrifugal Pumps and Blowers, based on designs perfected over 22 years of active experience in the centrifugal field. Also Turbine Pumps for handling small quantities at high heads. Our engineers will be glad to make a study of your problems and offer you recommendations, with estimates.

ROTARY POSITIVE RCW CENTRIFUGAL

ROOTS — CONNERSVILLE — WILBRAHAM

12th & Columbia — CONNERSVILLE, IND.

NEW YORK — CHICAGO — POTTSTOWN, PA. — PITTSBURGH — ST. LOUIS — DALLAS — SAN FRANCISCO

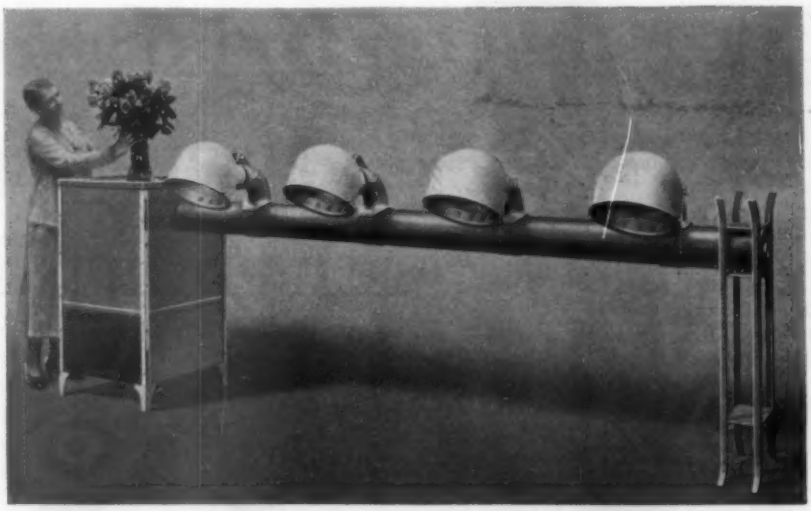
Miss America

DOES IT WITH GAS

Every hairdressing establishment in your territory will be interested in The Miss America Gas Multiple Unit Hair Dryer.

EVERY ONE OF THESE APPLIANCES SOLD MEANS A NEW LOAD FOR THE GAS COMPANY

Cuts costs as much as 50 to 80% over electricity and enables shops to serve more patrons in less time. Reduces usual time of drying hair 10 to 15 minutes.



SPECIAL FEATURES OF THIS NEW DRYER

Equipped throughout with Minneapolis-Honeywell controls Noiseless operation. Safety pilot. Easy adjustment.

Multiple unit system with independently operated head sets. Popular low model design, arranged to suit floor plan.

Gas chamber and air chamber are entirely separate. Clean, uniform heat insures rapid, comfortable drying.

Patrons may control air flow or leave dryer without assistance of operator.

Equipment finished in colors to harmonize with beauty shop. A steady load builder, easy to sell. Write now for price list and descriptive catalog.

Gas men in Chicago for the convention should arrange to see this new appliance on display in local showrooms, or operating in beauty shops or in the Miss AMERICA display offices.

COMFORTABLE

CONVENIENT

Miss AMERICA GAS MULTIPLE UNIT HAIR DRYER

608 South Dearborn Street Chicago, Ill.

Lux

Today with N R A Manufacturing Costs are more important than ever

You secure maximum efficiency and lowest purification costs with "Lux" the purifying material that made higher rate of flow possible.—

"Lux" gives longest service life in boxes due to its great activity and high capacity.

Ready mixed "Lux-Sponge" shipped from our own Sponge plants in Philadelphia and Chicago.

The Alpha-Lux Company, Inc.

192 Front Street, New York

Philadelphia **Chicago**

THE BEST GAS PURIFIER

Editorials

Fair Enough! WE somewhat agree with those folks who have bewailed the fact that the exhibit of gas appliances and equipment at the Century of Progress Exposition is not nearly as large and comprehensive as an undertaking the size of the gas industry would warrant. But it would be well not to lose sight of the fact that wherever heat is needed and used in the Exposition grounds—for heating office and other quarters, for cooking meals, for heating water, for many uses by exhibitors—gas regi[illegible] the rather tidy score of over ninety-eight per cent.

Roll that fact around in your head awhile, and you will derive more than the requisite remedy for counteracting any ill engendered by the lack of exhibits. At the same time, cheerfully hand a generous slice of credit to The Peoples Gas Light & Coke Company, for they have done a thumping good job in selling the gas idea to the end that ninety-eight per cent of all heat requirements are supplied by gas. Actually, if one can call this fair this or that kind of a show, he would have just as much license to call it a Gas Show.

If any worry is in order it should have to do with the question: How are we going to use this fact to the best advantage? Certainly information of this sort is fine ammunition for getting sales on the part of every gas company. Further, it is the type of publicity that will not wear threadbare after many months of use. We should use it extensively.

Gas men attending the Fair can be assured of a good program of papers and addresses. In addition, during their leisure—and they should plan to spend some time taking in the many industrial and scientific exhibits—they can count on increasing their store of general knowledge. And, as they stroll through the various exhibits, they should keep their eyes open and their brains alert to sense any additional places where gas can be used by industry in general.

That a trifle of detective work in this direction will result profitably none can deny. Especially is this so as regards industrial gas utilization. Some of us may well see one or two operations that employ heat that will immediately convince us that "you can do it better with gas."

What one sees translated into additional gas usage might well be the one big lesson taken home from the Gas Convention.

Hang Out the Latchstring THE visitors from abroad, after leaving the Fair and Convention, will visit a number of cities in this country. During this itinerary they will obviously call on a number of gas companies. The visited gas companies should and can be counted upon to extend a cordial greeting to our friends from across the water, and the ensuing interchange of ideas should be mutually beneficial.

NRA Must Go Forward IN the planning of so gigantic an undertaking as the N.R.A. affecting every industry in the country, there are bound to be some inconsistencies that will creep in here and there. Many feel that the government has leaned far over backward in favor of unionizing all labor.

When the plan was announced, its big object was to put men back to work. The hours per week a man could work were limited. A minimum wage was fixed so as to put employees on the same basis in all industries. Shorter hours put more men to work and guaranteed them a minimum wage so that no employer could chisel down wages. One hundred men working at $12 to $15 per week will spend much more than one man at $1200 or $1500 per week, so there did not seem any good reason to bring in the question of unionizing every industry and insisting on it in the various codes. In fact, it would appear that getting labor organized for permanent advantage is more to the front now than getting men back to work. One thing is certain, the buying power of the public must be increased before wages can be materially increased. As business increases, then if labor does not get its just share in increased wages, the power of the general public will be behind any body of labor that demands its fair share of profits. It would seem the big thing—i.e.—to get more men in jobs, has been sidetracked by labor itself in its mad scramble to unionize all industries.

However, the N.R.A. must go on. We should all fall in line and do our best to boost it along. President Roosevelt had the will to take a strong stand on the soldiers' bonus to help the government balance the budget. We believe he will use the same methods to bring to a halt the action of any body of men whose acts will tend to impede the N.R.A. plan. It is the "New Deal" and it has got to be also a "Fair Deal" if it is to succeed.

We urge the gas industry to uphold the codes, believing that the government officials will be glad to right any injustices that may crop up after the plan has been in operation for a sufficient time to develop them. Holding back won't accomplish anything more than to put off a little further the final consummation of the plan. When every one willing to work has a job, then a full measure of prosperity for all of us will have arrived.

Henry M. Riley

Editor.

SEP 2 5 1933

Pioneer Boosters for Gas Service

Office of the Atlantic Mut Ins Co
New York Aug 23 1850

Walter R Jones Esq
President &c &c &c

Dear Sir.

We the undersigned Clerks employed in this office, do most respectfully request that Gas Fixtures may be affixed to our respective desks, and that we may be permitted to use Gas in place of the Sperm Candles at present used

Aside from the injury to our eyes from the constant flickering of the light from Candles, it is believed, that after the first cost of the pipes, a great saving would be effected in the cost of light by the use of Gas in lieu of Candles and would tend much to our convenience in performing our duties.

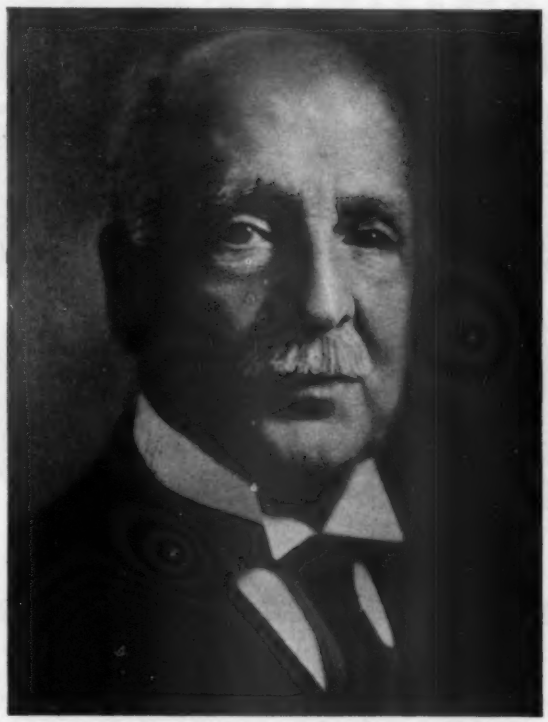
Very Respectfully
Your obt Servants

Jas Hewkins
Wm Campbell
Wm A Ellis
Jno A Condit
M Keeney
R Baldwin
Smith Jenkins
Saml J Wooley
A P Higgins
H D King
Charles Dennis
H F Hamilton
J Dunn

EIGHTY-THREE years ago there just wasn't much gas being used. Indeed, the industry itself was only thirty-four years old! And it was not until forty years after 1850 that the industry began to find itself insofar as the active selling of appliances is concerned.

Even today any business or industry prizes highly any effort on the part of its customers going out of their way to boost their product. How refreshing it is then to note in the above missive the early recognition on the part of the working public of the value of gas service!

CAREER SECURITY



ARTHUR HEWITT

President,

American Gas Association

I HAVE been asked to address a message to the younger men of the gas industry. May I preface it with this observation?

We who have been employed by gas companies during this period of acute industrial distress, have had special occasion to thank our lucky stars for steady jobs with regular pay,—a stroke of good fortune denied to millions of our fellow citizens. Should not such a record of performance by the gas industry instil in us a renewed sense of loyalty to our employers and a fuller devotion of ourselves to our individual tasks.

For the person who has eyes to see, and ears to hear, the gas industry has weathered this depression without sacrificing its objectives or losing its position in the competitive fuel picture. Opportunities for a successful career are therefore most promising.

There is one thing, however, of which we may be certain. The future is going to exact more from the individual. It will be kind to those who produce and hard upon those who do not produce. The world has "slipped" and must be brought back into balance. Hard work, intelligently applied, will be necessary to produce this result.

There is an infinitely greater need of an optimistic outlook today than there was in the flush days of 1929. The employee who steadfastly believes in the future of the gas industry and of his own company, and who demonstrates his faith in terms of good works, need feel no concern over the future or the rewards that will come to him.

Fitted Exactly to YOUR Requirements

No Matter What They Are!

GMC HEAVY DUTY TRUCKS

The GMC heavy duty line can provide *any* type of equipment—*exactly fitted to your particular needs.* No other line of commercial vehicles is so extensive or complete.

Eleven basic models cover the 5 to 15 ton range. GMC trailer equipment gives capacities to 22 tons. Six heavy duty engines are *regularly* available—uniform-design, 6-cylinder, valve-in-head, all of them! Forty-four distinct chassis . . . 14 rear axles . . . 7 transmissions—are *standard, available* selections for heavy duty use!

And, mark you—every GMC heavy duty truck is a regular production job! *From bumper to tail lamp—every one is truck-built by GMC!*

This is the industry's most comprehensive line of heavy duty trucks and trailers. It is matched, and rounded to completion, by a truck-built line of light and medium duty vehicles from 1½ to 4½ tons capacity.

Fitting commercial equipment *to your particular needs* can be done, with *scientific exactitude,* only with GMCs! The GMC representative is equipped to determine precisely the heavy duty truck that will do your job best . . . and most economically. Write or wire for further details—*today.*

GENERAL MOTORS TRUCKS and Trailers

GENERAL MOTORS TRUCK COMPANY — Time Payments Available Through Our Own Y. M. A. C. — PONTIAC, MICHIGAN

AMERICAN GAS JOURNAL
September
1933

"A Century of Progress" An All-Gas Show!

The Peoples Gas Light and Coke Company Entitled to a Vigorous Round of Applause for Their Efforts in Selling Gas to Virtually Every Exhibit and Feature Where Heat Was Needed

By CHICAGO CORRESPONDENT

CHICAGO had another World's Fair—they called it the World's Columbian Exposition—forty years ago. At that Fair, in the Summer of 1893, the death knell of the gas business was sounded—or so it seemed to many.

Electric light shone on the great Court of Honor in that Fair forty years ago. Eletcric light was everywhere—although there were plenty of gas lights. To thousands of visitors, it was their first glimpse of the new electric light. Gas lighting immediately became old fashioned. The gas business was going to collapse. Even stock prices of gas companies reflected this widespread belief.

Today, forty years later, it is inspiring to look at the record. In the intervening time, the gas industry has shown one of the most amazing comebacks in American corporate history. It has enjoyed a re-birth for which it is difficult to find a parallel in any other phase of industry. It achieved re-birth by finding and developing a new field for itself—the fuel field.

For today's Century of Progress Exposition in the big and little details that require the use of heat, is an "all-gas" show. By actual computation, it is over 98 per cent gas—fired and heated. And on the part of an industry which was mentally consigned to the limboes a generation earlier, that isn't a bad percentage representation.

Gas is used for everything, from refrigeration to porcelain enamelling, for which heat could be used, everywhere on the Exposition grounds, with the exception of a few concessions in the Electrical Group, regarding the existence of which no explanation is considered necessary. And gas is used for a great many things which were not even dreamed of in 1893.

GAS HEAT WARMS A LOG HOUSE: In Anne Rutledge Tavern on the World's Fair grounds, the gas-fired radiator does its job against a background of logs. The Century of Progress Exposition will be open until November 1, and heating equipment—gas, of course—is an essential part of all of the larger restaurants on the Fair grounds.

OLD HEIDELBERG—HEATED WITH GAS: Above and to the right of the two waiters in the rathskeller of Old Heidelberg, the unit heater is ready for the cool mornings and evenings of Autumn along Chicago's lake front where the Fair grounds lie.

For two years, for instance, gas has heated the Administration Building of the Fair, during the long winters when the Fair grounds—sand dredged from the lake—were being surveyed and staked out and tramped over by earnest groups of architects and engineers. During two Chicago winters, a gas heating plant left the staff of the Fair free to concentrate their energies on the job at hand.

That small gas boiler in the Administration Building laid the foundation for the Fair's pride in its absolute cleanliness. No smoke or soot or smudge or ashes have ever marred the beauty of the Fair. On the lake front, the Fair is showing Chicago—and the rest of the world—the advantages of real cleanliness. The "Smokeless Town" of the future is there!

And then, as plans for the three-mile-long Exposition were completed and approved, a problem of real dimensions presented itself to The Peoples Gas Light and Coke Company. The Exposition needed gas service, at every point on the grounds. Installing the miles of main necessary, in addition to the hundreds of services, would mean a sizable investment—how large, no gas man needs to be told. The service facilities would be in use for five months. After that, there was no prospect of their being used.

The late months of 1932 and the early months of 1933 did not come at a propitious time for the outlay of money on which there was little prospect of an adequate return. But, typical of the gas industry in its comeback, and typical of the spirit which built the Fair during the worst depression that had ever scourged the country, the Peoples company put in the mains—over five miles of distribution mains, making gas service available to every point on the Exposition grounds.

The gas industry, nationally and internationally, owes a substantial debt of gratitude to the Chicago company for having made this sacrifice at a time when sacrifices were not in fashion. The consequences of letting thirty million visitors to the Fair—more than one quarter of the country's population—see other fuels in service, cooking their meals and heating water, would have been a severe blow to the gas industry—and a most unwarranted one.

As it is, gas is on the job wherever heat is needed. The most sensitive gas boiler in the world generates steam to cure the tires which Firestone builds at its exhibit. The tiny infants in the Baby Incubator are gas-heated babies—an automatically controlled gas flame keeps each incubator at the proper temperature. A gas furnace anneals enamel and steel, in the exhibit of the Ferro-Enamel Institute, where novelty ashtrays are produced, with any design you care to scratch in the raw enamel fused indelibly onto the steel shell of the tray. The alligators in the Seminole Indian village swim contentedly in water kept at their favorite tepid heat by a gas-fired heater.

In fact, the entire range of the applications of gas heat—from gentle warmth to the fiercest temperatures—is duplicated on a small scale at the Fair—with a few new ones added, as listed above. Contrasted with the one meager use of gas at the Columbian Exposition 40 years

(Continued on page 18)

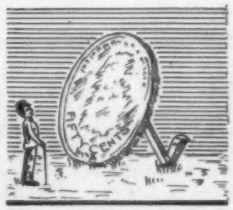
COOKING 10,000 MEALS A DAY: The all-gas kitchen at Old Heidelberg—ranges, bake ovens, coffee percolators, even egg cookers—keeps the meals coming to the hordes of hungry Fair visitors who drop in to rest their feet and refresh themselves.

How You Can Employ Your *Leisure Time* At The Fair

DELEGATES and their families attending the International Gas Conference and Fifteenth Annual Convention of the American Gas Association in Chicago will find the period from September 25 to 30 one of unusual interest and attractiveness at the Chicago World's Fair—A Century of Progress International Exposition.

From the standpoint of accessibility to the World's Fair no better place could have been picked for the business sessions of the convention than at the Hotel Stevens. From the Michigan avenue entrance to this great hotel one can reach the main entrance to the Fair grounds by bus or taxi within three to five minutes. The convention program has been scheduled carefully so that ample opportunity is provided delegates to visit the Century of Progress Exposition on Sunday, the day before the convention opens, as well as on Monday evening, Wednesday afternoon and Thursday evening. There will also be no afternoon meetings on Thursday, with the exception of the Technical Section and the Midwest Industrial Sales Council. A popular center of attraction in the Fair grounds during the convention week will be the gas industry's exhibit in Gas Industry Hall.

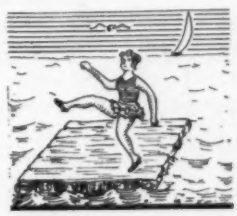
From the 13,000,000 visitors who have already thronged the Exposition grounds, word has gone around that the Fair is one of the biggest 50 cents' worth ever created.



From twenty to fifty special programs, ranging from parades, moving pictures, concerts, lectures and sports events are held daily—all included in the general admission.

The admission charge of 50 cents for adults and 25 cents for children under twelve is exactly the same as that of the World's Columbian Exposition of 1893. In addition to the special programs, visitors will find eighty-five exhibit buildings and features and eighty-two miles of exhibits included in this admission charge.

There are, of course, amusements, thrill features, service and eating places by the score. The expenditures on these, however, indicate that visitors are able to have as good a time as they like at small expense. The comptroller's department of the Fair has made a complete check on the money coming in to every activity within the fence. The amount spent by each visitor in addition to the admission fee has averaged about $1.12 since the opening of the Exposition. Of this, the average amount for food and refreshments was forty-five cents, showing that the Fair visitors are able to eat there economically. Forty cents was spent by the average visitor for thrill rides and amusement features.



The floating theatre on the north lagoon, the court of the Hall of Science, the court of the Travel and Transport Building, the court of the States on Northerly Island and the court of Honor near the North Entrance are daily the scene of colorful events, official receptions and programs of interest. State days and national days and days dedicated to great industries or associations provide varied attractions.

September 25 has been designated as "Maine State Day" at A Century of Progress. Ceremonies in observance of this event will be held during the day. The 25th has likewise been designated as Grand Army of the Republic Assembly Day. Veterans of the Civil War returning from their annual encampment will be welcomed to the Exposition. The Association of Military Surgeons is scheduled for a meeting at the Illinois Host House that day, too.

International Gas Industry Day will be celebrated on Tuesday, September 26, and will usher in the first general convention session of the American Gas Association at the Hotel Stevens. Opening addresses will be made by Rufus C. Dawes, president of A Century of Progress, and E. J. Kelly, mayor of Chicago, following which President Arthur Hewitt of the American Gas Association will introduce the distinguished visitors from overseas. Addresses will be made by F. P. Tarratt, persident of the British Institution of Gas Engineers; A. Baril, past president of the French Technical Gas Association, and Dr. Fritz Escher, president of the International Gas Union. The president's reception will be held in the ballroom of the Hotel Stevens that evening, followed by dancing from 9 P. M. to 1 A. M.

In the Fair grounds, on September 26, the Coe College Band of Cedar Rapids, Iowa, will parade to the court of the States in the morning. It is likewise scheduled for a concert in the evening. A lecture series, musical programs, moving pictures and various meetings are among features listed.

Wednesday, September 27, will be known as "Oak Park Day" in honor of Chicago's western neighbor. On the Floating Theatre the Huntinghouse Dance Studios will present a program of classical dances. The Coe College Band will present a concert, as will the Benton Harbor High School Band from Benton Harbor, Michigan.

At 12.30 P. M. on Wednesday, the ladies attending the convention will be entertained at luncheon in Old Mexico, one of the most popular and colorful eating places in the Exposition grounds, and one that faithfully reveals a real Latin-American atmosphere. There will be Mexican folk dancing and other features to make the occasion a memorable one.

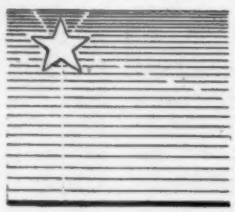
The Military Order of the World War will celebrate its special day on September 28, with members drawn from every state in the Union for the special ceremonies which will be held at Fort Dearborn during the morning and in the Hall of Science in the afternoon. The same day has likewise been dedicated to members of the acetylene industry. The afternoon will witness a concert by the Coe College Band in the "Rainbow Area" at the south end of the Fair grounds.

National Democratic Day will be celebrated on Friday, September 29, with leading Jeffersonians from all parts of the United States in attendance.

A "Big Ten" football game between a team from Northwestern University and the University of Iowa will be the leading feature of Saturday, September 30. This day has been officially designated as "Iowa Day" and thousands of Iowans are expected to visit the Exposition and root for their team. An outboard motorboat regatta from 11 to 4 will provide diversion with leading racers as the performers.

The foregoing combination is merely a sketch of some of the special attractions that will be offered during the week beginning September 25.

An event which at nightfall attracts thousands to the court of the Hall of Science is the Arcturus Ceremony following which the dazzling outdoor lighting effects are turned on. Each day from the opening date when it piqued the imagination of the world, this ceremony has been repeated.



From the star Arcturus, and carried 240 trillion miles on a beam of light, came the signal on opening night. Four astronomical observations and three commercial organizations joined forces to capture the light beam and relay an impulse from it to Chicago. Another orgainzation has since joined the original group to continue the lighting ceremony during the course of the Exposition.

September will bring A Century of Progress to the height of its activity. Then but a few weeks remain until this great project with its challenging architecture, its exhibits and attractions drawn from every corner of the world, will cease to exist. With its closing, October 31, will pass an experience such as this generation may never see again.

An All-Gas Show

(Continued from page 16)

earlier, the growth in the value and service of gas is shown in striking form, and in a manner most encouraging to those identified with the industry.

In every one of the hundreds of eating places on the grounds, which are jammed from early morning until the small hours of the following day—visitors to the Fair seem to get hungry at all hours—gas for cooking is on the job. In the immense kitchens of a score of the Fair restaurants are batteries of heavy-duty ranges and bake-ovens that would do credit to a first-class hotel or metropolitan restaurant. In the other prominent eating places on the grounds the commercial-size gas range does the cooking. And in the scores of hamburger and "red-hot" stands where hurried sightseers may refresh themselves before rushing on to the next exhibit, gas plates and gas coffee urns help to feed the hungry throngs.

In other words, think of a heating need and you will find a gas burner filling it. Civilized America has found a great many new ways to use heat—and heat is coming increasingly to mean gas heat.

But it is in the model homes which surround Gas Industry Hall at the Fair that the real gas show is playing to capacity crowds. In the Masonite "all gas" home, which has had more visitors than could be taken care of, every modern gas appliance is shown in an ultra-modern setting. The heating installation is behind plate glass under the main staircase (the house has no basement, since none was needed, in the opinion of the architect). The water heater shares this space. In the kitchen, the gas refrigerator assures constant cold at the expense of no mechanical hubbub, and the gas range blends with its attractive surroundings.

As the gas man looks over Chicago's Century of Progress Exposition, and counts up the number of places and the variety of ways in which gas is on the job, his conclusion is apt to be that even if he had been given the right to design the Fair to suit himself, he wouldn't have made many changes.

Because it's almost a 100 per cent gas show. Electricity is still used for lighting, as it was 40 years ago, but the big news is gas.

And that is something to remember.

Cost To See The Fair

FOR $16.65 an adult can see everything that is to be seen at A Century of Progress. This includes going into every pay concession and Midway amusement. Add to this a $3 observation ride in a dirigible balloon, a $3 airplane ride and a 50c boat tour of the lagoons and the total is $23.15. A child under twelve years old can do the Entire Fair, including all pay attractions, for $12.05.

This is the officially tabulated, outside total.

What actually happened was that the 2,464,413 visitors who paid gate admission to the Exposition in its first month, May 27 to June 27, spent $2,500,000 among the concessions, an average of a dollar each, in addition to their 50c admission (25c for children under 12.) The attendance for the first month was more than was expected.

The gate admission of 50c for adults and 25c for children includes eighty-five exhibition buildings and features and eighty-two miles of exhibits.

Prominent Gas Men From Abroad To Attend Convention

ON September 4th, leading executives of the gas industry in several European countries began arriving in the United States to attend the convention of the Canadian Gas Association in Ottawa, September 18 and 19, and the International Gas Conference and Fifteenth Annual Convention of the American Gas Association in Chicago, September 25 to 29.

The delegation that arrived, Monday, September 4th, on the *Ile de France*, consisted of G. Descours, G. Monod and R. Piaton, members of the Council of the French Society of Gas Engineers, and executives of gas companies situated at Lyons and Paris. A second French delegation arrived in New York, September 13, while the British delegation, consisting of 47 men and 14 women, disembarked at Quebec on September 15.

Seventy-Five Delegates

There will be seventy-five foreign delegates present at the International Gas Conference at Chicago. The National Gas Council of Great Britain and Ireland will be represented by W. J. Grey and W. M. Carr, while George Braidwood will represent the North British Association of Gas Managers. H. E. Bennett, F. B. Richards, F. J. and F. West, H. J. Toogood, A. H. Lymn, D. B. Parkinson and R. P. Chester will represent the Society of British Gas Industries. Returning from the World Power Conference at Stockholm is T. Watanabe of Tokyo, who is expected to arrive in time to represent the Imperial Gas Association of Japan.

September 26 has been officially designated as International Gas Industry Day at the Century of Progress Exposition. Addresses will be made by F. P. Tarratt, president of the British Institution of Gas Engineers; A. Baril, past president of the French Technical Gas Association, Dr. Fritz Escher, president of the International Gas Union and Arthur Hewitt, president of the American Gas Association.

C. E. Paige, vice-president of The Brooklyn Union Gas Company, Brooklyn, New York, is chairman of the Reception and Arrangements Committee of the American Gas Association. The visiting delegates will make a sightseeing tour of Canada and the United States, stops being scheduled for Niagara Falls, N. Y., Detroit, Washington, D. C., Pittsburgh, Baltimore, Cleveland, where an inspection will be made of the Testing Laboratory of the American Gas Association, Philadelphia, Boston and New York.

Members of the Institution of Gas Engineers sail for Canada and the United States on Friday next.

[Cartoon by Wallace Coop

Courtesy, The Gas World, London, England

Current Trends IN GAS COMPANY ADVERTISING

Analyzed By

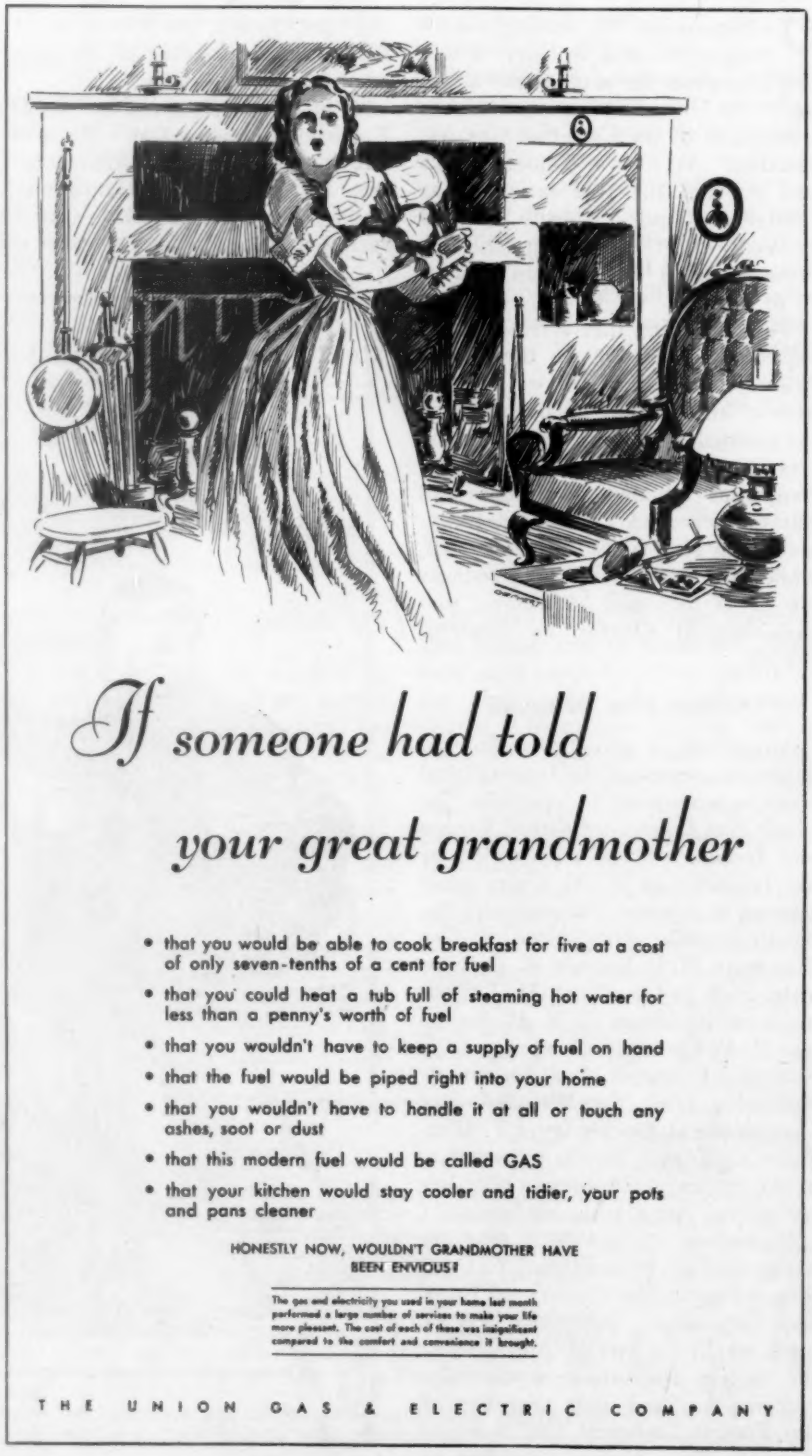
THE COPY WRITER

THE biggest problem of the advertising man today is that of keeping up with the rapid changes in social and economic conditions. Only yesterday we were talking and thinking economy . . . economy . . . economy. Suddenly, economizing has become unpatriotic. Prices are going up. Undercutting competitors is contrary to the spirit of the Code. How are the gas companies meeting the situation in their advertising?

It is too soon, perhaps, to give many concrete examples. Nevertheless, it is evident even at this early date that there *is* a trend which shows that the leading gas companies, at least, are aware of the influence, if not the nature, of the effect on their operations.

The Better Copy Contest of the Public Utilities Advertising Association, which has often pointed the way to advanced thinking in advertising matters, awarded the prize for 1932 to the gas company (Lone Star Gas System) that did the most to lend dignity to the humble and heretofore much neglected penny. "Your Lowest Priced Domestic Servant" was the heading, and the copy proceeded to point out that one cent's worth of natural gas would cook a dinner for 3 people; operate a living room heater 45 minutes and a bathroom heater for 2 hours; heat enough water for two baths and 14 morning shaves; make 33 cups of coffee, and operate a laundry dryer 45 minutes, an incinerator 15 minutes, and a gas refrigerator from 8 to 10 hours. The Lone Star did a smart thing when it repeated this advertisement in local newspapers after the results of the contest were announced, under the heading "We Present A Prize-Winning Ad."

There is ample opportunity as


If someone had told
your great grandmother
• that you would be able to cook breakfast for five at a cost of only seven-tenths of a cent for fuel
• that you could heat a tub full of steaming hot water for less than a penny's worth of fuel
• that you wouldn't have to keep a supply of fuel on hand
• that the fuel would be piped right into your home
• that you wouldn't have to handle it at all or touch any ashes, soot or dust
• that this modern fuel would be called GAS
• that your kitchen would stay cooler and tidier, your pots and pans cleaner
HONESTLY NOW, WOULDN'T GRANDMOTHER HAVE BEEN ENVIOUS?
The gas and electricity you used in your home last month performed a large number of services to make your life more pleasant. The cost of each of these was insignificant compared to the comfort and convenience it brought.
THE UNION GAS & ELECTRIC COMPANY

"So She Would—And So Are We"

well as a great need for authentic information and data which gas companies can use in this type of advertising. Logically, this should be provided by the American Gas Association's testing laboratory in cooperation with the Statistical Department and the Commercial and Publicity and Advertising Sections of the Association. Differentials could be worked out according to local rates and any other differences resulting from the variation in B.t.u. content and the character of gas supplied could be noted for local application. The present situation is unnecessarily confused.

Good Work by Milwaukee

Where cooking costs are involved, of course, it is necessary to be specific both as to the kind of meal that is prepared and the number of people to be served. The Milwaukee Gas Light Company, which carries the standard slogan "Gas is cheap in Milwaukee," began by advertising the general claim that "Gas will cook three meals a day for 3 cents." Latterly, it too, has decided to glorify the penny, which it does very effectively by showing that one cent will cook a breakfast for a family of four, consisting of cereal, eggs, toast, and plenty of coffee. Five cents will cook a dinner for six people in an hour and thirty-five minutes. The menu includes baked pork chops with dressing, glazed apple rings, scalloped potatoes, stewed tomatoes, cole slaw, apricot cobbler, and coffee.

The automatic gas kitchen is being featured by the Consolidated Gas Company of New York, but each advertisement in this series contains a box with a full menu and the caption *"Less than a cent a person* is all it costs to cook this roast dinner for six people on one of the new gas ranges." The Public Service Company of Northern Illinois is specializing in appetizing illustrations of home-canned products and dinner dishes with emphasis on the low cost of preparing them. As a combination utility, this company solves the ever-present problem of how to combine the claims of gas and electricity in one advertisement—which it does in one instance with a "Warm Weather Menu" and the following message: "2 cents' worth of electricity baked five of these fluffy crisp waffles . . . . ½ cent's worth of gas fried a pound of these tasty little pork sausages." Incidentally, how many gas companies tried to build up their summer cooking load this year by advertising the health value of having at least one warm dish included with meals served during hot spells?

Here is a job for the A. G. A. Home Service Committee to work out adequate menus and test conditions for advertising departments.

The Union Gas and Electric Company not only uses specific cases, but works them into an effective testimonial. As in the Milwaukee advertisement it tells that "One Cent's Worth of Fas Cooks Breakfast for Four." Here, however, the announcement is attributed to an individual customer whose name, address and charming features are prominently reproduced. The copy does not neglect to point out that the cost of the food itself was twenty cents. A signed statement from another customer says "Half a cent's worth of gas heated the water to wash my dinner dishes." And a third testifies to "An Invigorating Shower for Less Than One-Fifth of a Cent." In each of these cases a member of a prominent local engineering firm was asked by the gas company to make the test on the customer's premises, thus giving the advertisements a disinterested atmosphere.

COOK this Dinner on a MODERN Gas Range
Menu
AN OVEN DINNER FOR A BUSY DAY
MILWAUKEE GAS LIGHT COMPANY
Baked Pork Chops with Dressing
Glazed Apple Rings
Scalloped Potatoes
Stewed Tomatoes
Cole Slaw
Apricot Cobbler
Coffee
MAKES COOKING EASY
See the new Roper Insta-matic Full Automatic Gas Range at the Milwaukee Gas Light Company.
= 5c =
The above oven-cooked dinner for six persons was prepared in one hour and thirty-five minutes with about 5 cents worth of Gas.
With Gas . . . the ideal Fuel . . . healthful, tasty dinners are quickly prepared at unusually low cost . . . Gas is cheap in Milwaukee.
after all GAS IS BEST
Milwaukee Gas Light Company
MILWAUKEE enjoys one of the lowest rates on manufactured Gas of any major city in the United States.

Featuring Low Cooking Costs

For example, an electric company is passing on to its customers the discovery that "One Cent of Electricity Equals $2.00 Worth of Candles." The Union G. & E. goes a step farther with an advertisement which we hereby nominate for the best gas copy of the year. Here it is:

"IF SOMEONE HAD TOLD YOUR GREAT GRANDMOTHER . . . that you would be able to cook breakfast for five at a cost of only seven-tenths of a cent for fuel . . . that you could heat a tub full of steaming hot water for less than a penny's worth of fuel . . . that you wouldn't have to keep a supply of fuel on hand . . . that the fuel would be piped right into your home . . . that you wouldn't have to handle it at all or touch any ashes, soot or dust . . . that this modern fuel would be called GAS . . . that your kitchen would stay cooler and tidier, your pots and pans cleaner . . . Honestly Now, Wouldn't Grandmother Have Been Envious?"

So she would—and so are we.

Some other figures are interesting to observe. The Central Hudson Gas & Electric Corporation — which seems to have solved the problem of reproducing half tone illustrations

satisfactorily on cheap newspaper stock—carefully phrases its statement that "fifteen cents per day will pay the cost of automatic hot water in this city, for average family usage." Undoubtedly there will be complaints from customers whose bills are higher. On the other hand, why be afraid of doing constructive factual advertising — which was never needed more than it is today—just because some individuals may choose to argue about it? The important thing, it seems to us, is to be sure of the facts and then give them the widest possible publicity. What we need is more, not less, opportunities for discussion with our customers.

While we are on the subject, have you seen Union's new gas heating campaign? It is just one jump ahead of the NRA, and thus deserves mention in any discussion of advertising trends. Prices are going up. Wages are going up. Gas rates are fairly stable, with a downward tendency, if any. A new market for gas heating is opening up.

With this combination of events, plus a refreshing optimism, this Cincinnati utility loads its rifle with ammunition directed at—believe it or not—locomotive engineers, stenographers, garage mechanics, and hod carriers! "Here's No Millionaire" is the caption for a swell photograph of a smiling darky in overalls, while the copy leaves no doubt when it says, "We can give you actual names of workers like this man, who are heating with gas and saving money." A clever touch in the advertisement referring to stenographers was the reproduction of the headline in shorthand, translated for the rest of the public at the base of the copy.

The Peoples Gas Light & Coke Company of Chicago is another concern that is going after gas heating in a big way by using the low cost appeal. "New . . . Low Cost Gas Heat" is the theme of the campaign, with a free trial installation offered as a special inducement to attract the mass market. Previously, the same company had been offering a rental plan for conversion burners at the rate of ten cents a day with the hypothetical customer asserting "I wouldn't tend a furnace for twice the cost of my Gas Heat."

These and other signs indicate conclusively that gas companies, even in promoting so-called luxury conveniences, are broadening their sales appeal to a much wider audience than they ever dared to try to reach before.

This is in line with much of the recent national advertising of automobile manufacturers, particularly those whose names have been a synonym for high prices. Chrysler's *Saturday Evening Post* copy, for example, introduces "history's lowest price" with an imaginary prospect's discovery that "I Never Dreamed You Could Buy One for That!" A syndicated gas advertisement in a similar vein carries this part of a dialogue: "Tom, we're actually saving money with an all-gas equipped home." While the Atlanta Gas Light Company, following the Consolidated Gas Company's lead in featuring "The Most Modern House Heating Known . . . yet the average home can easily afford it," adds the thought, "It's Time Everyone in Atlanta Discovered the Moderate Cost of Natural Gas Heat."

With such advertising, and a suitable schedule of rates to support it, gas heating should begin to make real strides toward general acceptance as the "universal fuel."

The Treatment of Asphyxia Due to Carbon Monoxide or Cyanide by Artificial Respiration and Methylene Blue

By S. C. DICKINSON

Chairman, Accident Prevention Committee, Pacific Coast Gas Assn.

Carbon Monoxide

CARBON monoxide (CO) is a gas at ordinary temperatures. Only rarely does it occur in nature; it is, however, almost universally present wherever man lives and works. It usually originates from the incomplete combustion of carbonaceous material. Carbon monoxide is a constituent of illuminating gas (6 to 30%), water gas (40%), blast furnace gas (24 to 30%), producer gas (22 to 26%), coal fires, flue gas, charcoal braziers, coke-burning salamanders, smoke in burning buildings, mine fires, after damp (a gas formed after a mine explosion), and internal combustion engine exhaust (1 to 7%).

Carbon monoxide is one of two chemical asphyxiants. It is an asphyxiant through its property of combining with the hemoglobin (a compound forming the solid coloring-matter of red blood-corpuscles). Simple asphyxiants such as nitrogen (N), carbon dioxide (CO_2), and natural gas (CH_4), exert their action in the lungs by keeping oxygen from reaching the blood, but carbon monoxide exerts its action in the blood itself. Oxygen (O) is brought in contact with the blood in the lungs

Read before Pacific Coast Gas Assn. Meeting, Los Angeles, Cal., Sept. 13-15, 1933.

in ample quantity at all times during most cases of CO asphyxia, but the blood cannot absorb or transport it.

CO has a greater affinity for hemoglobin than has O; the relative attractions are approximately 300 to 1. The relative amounts of O and CO in the air breathed determine the proportions in which the hemoglobin is distributed between the two gases. Roughly, one-half the CO inhaled is absorbed during the early stages of exposure. Four thousand (and above) parts of CO per million parts of air are fatal in exposures of less than one hour. Unconsciousness, respiratory failure, and death will result rapidly when the per cent. of hemoglobin in combination with CO reaches 80.

Carbon monoxide is eliminated through the lungs when air free from CO is inhaled, but the anoxemia (an abnormal condition due to deficient aeration of the blood) does not cease as soon as fresh air is inhaled, but persists in diminishing degree during the period of elimination. Complete elimination under the action of fresh air is not effected for many hours. Inhalation of O and 5% CO_2 will hasten the elimination.

Artificial respiration is necessary when respiration ceases.

Symptoms of Carbon Monoxide Poisoning

The symptoms of CO poisoning may be divided into two stages, depending on the action of the nervous system, the first being a stimulation, covering the period beginning with normal and ending in syncope,[1] and the second a paralysis of the central nervous system beginning in syncope, extending through coma, and ending in apnea.[2] The order of action in each is the brain, spinal cord, and medulla.

Stage 1. — Tightness across the forehead, dilatation of cutaneous vessels, headache (frontal and basal), throbbing in the temples, weariness, weakness, dizziness, nausea and vomiting, loss of strength and muscular control, increased pulse and respiration rates, collapse. All of these are greatly increased and accelerated with exercise on account of the additional need of O in the tissues. Men at rest have often been exposed to carbon monoxide all day without noticing any marked ill effects, but on walking home or exercising have experienced severe symptoms, even to unconsciousness.

It is seldom that all of these symptoms are experienced by the same individual. Also, in some cases the poisoning may proceed to the stage of syncope without the victim feeling any of these symptoms, this frequently occurring if the poisoning has been rapid.

Stage 2.—Increased pulse and respiration, fall of blood pressure, loss of muscular control, especially sphincters,[3] loss of reflexes, coma usually with intermittent convulsions, Cheyne-Stokes' respiration, slowing of pulse, respiration slow and shallow, cessation of respiration, death.

Saturation of Blood and Occurrence of Symptoms

With a given blood saturation, the character and severity of symptoms acquired during exposure depend upon the time required to attain that saturation and the degree of muscular activity—in other words, the extent of oxygen deprivation.

Effect of time required to produce the saturation.—The number of symptoms decreases with the rate of saturation. With high concentrations the victim may experience but few (weakness and dizziness) of those given under stage 1 of symptoms. If a given saturation has been acquired by a long exposure to a low concentration, the symptoms and after-effects will be a great deal more severe when a given saturation has been acquired than by a short exposure to a high concentration.

Effect of muscular activity.—This increases the number and accentuates the character of the symptoms during exposure, and will bring out latent symptoms after exposure. A person at rest may pass into a state of dizziness and unconsciousness without experiencing any marked previous effects.

General.—In general, the predominating symptoms accompanying the various percentage saturations are as follows:

Symptoms Caused by Various Percentages of Carbon Monoxide in the Blood

Percentage of blood saturation	Symptoms
0-10	No symptoms.
0-20	Tightness across forehead; possibly slight headache, dilatation of cutaneous blood vessels.
20-30	Headache; throbbing in temples.
30-40	Severe headache, weakness, dizziness, dimness of vision, nausea and vomiting, collapse.
40-50	Same as previous item with more possibility of collapse and syncope, increased respiration and pulse.
50-60	Syncope, increased respiration and pulse; coma with intermittent convulsions; Cheyne-Stokes' respiration.
60-70	Coma with intermittent convulsions, depressed heart action and respiration, possibly death.
70-80	Weak pulse and slowed respiration; respiratory failure and death.

Time Required for Various Concentrations of Carbon Monoxide to Produce 80 Per Cent. of Equilibrium Value of Blood Saturation

Concentration of carbon monoxide in air (inclusive)	Percentage blood saturation (80%) of approximate equilibrium values	Time, Hours
0.02-0.03	23-30	5- 6
0.04-0.06	36-44	4- 5
0.07-0.10	47-53	3- 4
0.11-0.15	55-60	1½- 3
0.16-0.20	61-64	1- 1½
0.20-0.30	64-68	½-¾
0.30-0.50	68-76	20-30 min.
0.50-1.00	73-76	2-15 min.

The rate at which a man is overcome and the sequence in which the symptoms appear depend upon several factors: the concentration of the gas, the extent to which he is exerting himself, the state of his health and individual predisposition, and the temperature, humidity, and air movement to which he is exposed. Exercise, high temperature and great humidity, with no air movement, tend to increase respiration and heart rate and, consequently, result in more rapid absorption of CO.

Treatment of CO Poisoning

The steps in effective treatment of acute CO poisoning are:

1. Remove the victim to fresh air as soon as possible.

2. If breathing has stopped, or is weak and intermittent, artificial respiration by the Schaefer method should be given until normal breathing is resumed, or until after the heart has stopped.

3. Administration of oxygen 95% and CO_2 5% for twenty minutes or

[1] *Syncope—a partial or complete temporary suspension of respiration and circulation due to cerebral anaemia;*[a] *a fainting, a swooning.*

[a] *Anaemia—a deficiency in the quantity of blood or its constituents.*

[2] *Apnea (Apnoea)—a partial suspension of breath.*

[3] *Sphincter—a ring like orifice which closes a natural opening.*

more, beginning as soon as available.

4. *Treat for shock.* Keep patient *warm*, quiet, comfortable, and allow no exertion whatever.

5. Administer methylene blue as soon as available (see below).

Cyanogen Compounds and Action of Cyanides

The second chemical asphyxiant is cyanide (CN) in its various compounds. Hydrocyanic gas and cyanogen are used as disinfecting agents in ridding ships or buildings of vermin. The acid is evolved when celluloid is burned and appears in small amounts in blast furnace gas and in impure coal gas. It is also evolved from its alkali salts by contact with air; these salts are used extensively in various industries such as the extraction of gold from its ore. The nitrites and cyanogen chloride are little used. The latter substance is distinguished from the rest of the cyanide compounds by its pronounced irritating action upon the respiratory tract.

Cyanide neither prevents O from reaching the blood as in the case of simple asphyxiants, nor from being absorbed into the blood and transported by it as in the case of CO poisoning. It acts in the tissues and prevents them from using the O which reaches them. Cyanides arrest the activity of all forms of living matter. They exert an inhibiting action upon tissue oxidation, presumably by combining with the catalysts[4] in the living cells of the body tissues containing iron and sulfur. The tissues manifest life by heat and movement, and the continual oxidation of foodstuffs. Cyanides stop this oxidation, and the vital functions are suspended. The suspension is maintained only during the presence of cyanide; its removal allows the return of normal function, if death has not occurred during the period of O starvation. Cyanide poisoning is a form of asphyxia caused by the arrest of internal respiration.

The cyanides are rapidly destroyed in the body, combining with sulfur to form non-toxic sulfocyanides.

[4]*Catalyst—a substance which hastens or strengthens a chemic or physical process.*

Symptoms and Treatment of Cyanide Poisoning

Acute cyanide asphyxia is one of the most rapid modes of death, for the reason that the use of O by the tissue is prevented, although respiration continues for a brief period, and during this time is greatly increased in volume. In the ordinary case of acute poisoning, the man falls after a few breaths of the atmosphere contaminated with the gas. Death follows in six to eight minutes.

120 to 150 parts of HCN per million parts of air are dangerous in thirty minutes to one hour and is rapidly fatal when the concentration reaches 3000.

In less acute but still fatal cases the sequence of events is less rapid and symptoms typical of asphyxia are more clearly seen. Mild cases and non-fatal cases of poisoning result in headache, a feeling of suffocation, and some nausea; these symptoms pass off after several hours. For treatment:

1. Render artificial respiration and treat for shock as directed for CO poisoning.

2. Administer methylene blue as soon as available (see below).

Use of Methylene Blue

Considerable publicity has been given to the use of methylene blue for the treatment of CO and CN poisoning. Likewise literature on the same subject is now available, and from these, as well as personal communications, its use seems to be entirely justified.

The treatment consists of the intravenous injection of 50 cc of methylene blue, 1% in aqueous solution, repeated later if necessary, but not to exceed 150 cc in a period of two hours. Epinephrine may be administered as a further supportive treatment.

From the findings of the experimentalists it appears that the substitute—catalyst-methylene blue—acts as a temporary catalyst in place of the bound hemoglobin until normal respiration is again restored in the case of CO and with CN mediates in the oxidations necessary for the continuance of cell life during the period in which the natural catalyst is either generated *de novo* or regenerated by dissociation from its cyanide complex (or both), and the liberated cyanide is metabolized[5] away.

In experiments conducted by Dr. M. M. Brooks working at the University of California, she found that rats rendered unconscious by an atmosphere of either 1% CO or CN, regained consciousness more rapidly after an injection of methylene blue. The time of recovery from CN was reduced approximately 64% in comparison with the time taken by controls receiving no injection, and in the case of CO, the reduction in time was 43%.

Need for Prompt and Proper Action

In dealing with these deadly and rapidly acting poisons, it is *essential that every effort be made to eliminate delay in administration of the treatment.*

The accepted procedure is as follows:

1. Sustain breathing through the administration of artificial respiration by the Schaefer or Prone Pressure method. The application of the method *must be commenced as quickly as possible and maintained continuously until natural breathing is restored or until rigor mortis sets in.* Interruption of the application of the method must not be tolerated for any reason.

2. *Administer methylene blue as quickly as possible.* The injection of the dye should be made *only by a physician or other qualified person.*

Dr. J. C. Geiger, Department of Health, City and County of San Francisco, recommends (June 20, 1933) that if cyanide has been swallowed, give sodium thiosulphate, 10% in water, 500cc, using stomach tube if necessary. Inject intravenously (median basilic vein) 50cc methylene blue (1% in 1.8% sodium sulphate solution), repeat in fifteen minutes, if necessary.

In carbon monoxide and cyanide poisoning by inhalation, gastric lavage is not necessary.

An emergency methylene blue package is on the market (E. D. Bullard Company, 275 8th Street, San Francisco). The package is compact, carefully packed and sealed, and the contents are fully sterilized and ready for instant use. It contains two Luer

[5]*Metabolism—the process by which living cells or organisms incorporate the matter obtained from food into a part of their own bodies.*

needles (22g. 1½ inch), one ampoule of skin sterilizing fluid, one file for breaking ampoule, one 50 cc ampoule 1% methylene blue solution, and one 50cc Luer glass syringe.

Methylene blue is a stable solution, retaining its properties indefinitely.

It is suggested to industry in which CO and CN hazards exist, that one emergency package with at least two additional methylene blue ampoules be made available for use. The physician could be rushed, with the methylene blue to the patient or vice versa. However, ***artificial respiration is to be carried on continuously in either case.***

Cases

Two out of some fifteen or twenty cases in which methylene blue has been used are cited below:

1. With suicidal intent a young man had swallowed about 15 grains of a solution of potassium cyanide. When brought to the hospital, he was comatose,[6] with spasms of the voluntary muscles, and extreme hypertension of the hands and feet. After gastric lavage with sodium bicarbonate, an injection of 50 cc of a 1% solution of methylene blue was made into the median basilic vein. Within a very short time voluntary movements were noted and before five minutes had elapsed the man was conscious and appeared to be essentially normal except for a severe chill and an apparent flushing. Recovery was complete within fifteen minutes.

Under any previous method of treatment, this case would probably have been abandoned as hopeless.

2. A man attempted suicide, utilizing the exhaust from a motor car. A flexible tube was used to convey the gases from the exhaust of the motor to the closed body of the car. A meter reader of the Pacific Gas and Electric Company (Mr. Donald Cole) found the patient in the private garage, sitting in the car with the motor running. Although the man was unconscious and apparently lifeless, he was quickly removed to the open air and was given artificial respiration by Mr. Cole. The Emergency Hospital Service received a call for an ambulance at 2:40 P. M. and augmented the artificial respiration with the inhalator (using carbogen) at 2:45 P. M., twenty minutes after Mr. Cole had started artificial respiration, and this was continued for a period of twenty minutes. The steward's report states that "On arrival of the ambulance, all clinical signs of life were negative, no radial pulse, no apparent heart sounds, respiration had entirely ceased, pupils dilated and fixed, deep 'blue' cyanosis, profound rigor of neck and body muscles and chest rigid, making it very difficult to give artificial respiration—it was fully 4 or 5 minutes before any reaction took place. When the patient was removed from the street to the hospital his pulse was 80, full and forcible, respiration about 14, and a very small amount of cyanosis."

On admission to the hospital at 3:10 P. M., according to the hospital records, the patient was unconscious, had a pulse rate of 126 (of weak character), and a respiratory rate of 36. He was given 50 cc of 1% solution of methylene blue, intravenously, and external heat was applied. "Some response" was noted after this first injection, but at 4:00 P. M. a second injection of 50 cc was given "with marked results. Patient able to speak coherently. Relapse. Methylene blue 20 cc 1% at 4:30 P. M. renewed response," completes the hospital record of treatment given. The patient was removed to a private hospital the following day, when his condition was quite satisfactory. His attending physician expressed his opinion to the effect that he was quite confident that his patient would not have survived had the usual treatment not been augmented by the use of methylene blue. The story of this case is presented in some detail in an effort to emphasize the importance of the use of ***artificial respiration***, which should have recognition for the role played in the successful treatment of this case of what was probably carbon monoxide poisoning.

[6]*Comatose—drowsy or resembling coma.*

Traveling Kitchen Used In New York

Sponsored by the Consolidated Gas Company of New York, and its affiliated gas companies in the Bronx, this automobile truck is touring certain sections to give actual demonstrations of the value of modern kitchen equipment. Miss Alice Phillips, of the Company's Home Service Division, bakes cakes in the gas range and shows how the gas refrigerator simplifies kitchen work in her demonstrations to home makers. The range and refrigerator are supplied with gas from a portable tank, and are operated just as they would be in a customer's kitchen. This is the first time that a travelling exhibit of this kind has been used in New York to damatize the service rendered by modern gas appliances.

Gas Heating Calculations SIMPLIFIED

Part II - Selecting The Heating Appliance

By O. J. KUENHOLD
Gas Heating Engineer, Forest City Foundries Co.

WHEN we have calculated the heat loss from a space warmed to designed room temperature during weather conditions assumed as the worst ordinarily occurring, we have the room input in BTU's required to maintain the desired room temperature. To this room input it is necessary to add—

Reserve Heating Capacity—This extra capacity is required to provide (1) quick "pick-up" of room temperature after the room temperature has been permitted to drop below design temperature; (2) safety margin for uncertainties; (3) ample capacity to warm the space in occasional colder or windier than assumed worst weather; (4) greater operating economy and (5) that flexibility and response which makes for satisfaction.

When room temperature has been dropped, as for instance during the night, the temperature of inside walls and furniture gradually drops to approximately the reduced room temperature and the outside walls drop to a temperature approximately half way between the room and outdoor temperature. When room heat-input is increased to restore the design temperature, comparatively few BTU's of heat are needed to rewarm the air in the rooms but the walls retard advance of room temperature by "soaking up" from 40 to 80 times as much heat per cubic foot as the air in the rooms. If only sufficient room input is provided to *maintain* designed room temperature, such great difficulty will be experienced in rewarming the rooms after a temperature drop in severe weather that, not only will no economy result by dropping room temperature at night, but any attempts to drop night temperature during the colder weather will have to be abandoned.

The percent of reserve capacity which should be added is influenced by (1) the extent and duration of the temperature drop, (2) the time required by the heating appliance or system to increase the rate of heat delivery into the rooms, and (3) the heat absorbing capacity of the walls and room contents. Insulated walls and ceilings absorb heat more slowly.

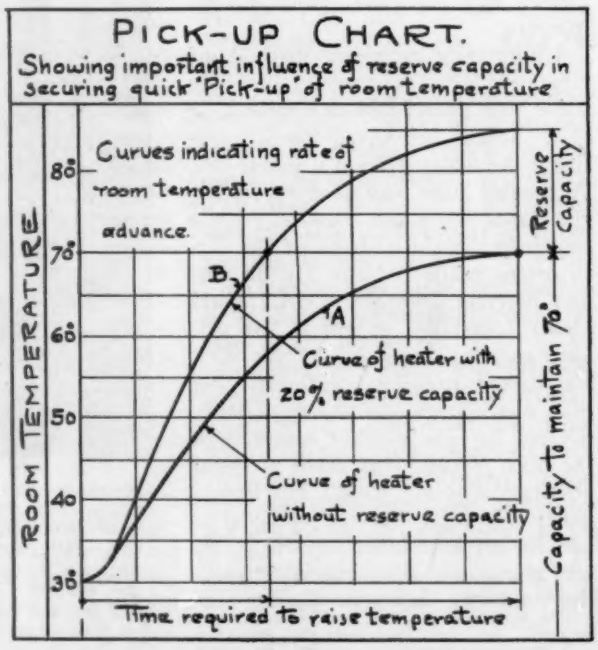
The Source of Heat for warming rooms may be (1) a fuel consuming heater located in the space it heats; (2) radiators heated by circulation of steam or hot water; (3) warm air ducts delivering warmed air directly into the rooms. The heat may be distributed in the rooms (1) entirely by direct radiation of heat, as from a radiant fire heater placed in a vented fire-place; (2) entirely by convection (warm air circulation) as from a warm air duct; (3) by a combination of radiation and convection as from radiators and vented space heaters, or (4) in part by circulation of combustion products vented into the room as with unvented heaters.

Pick-up Capacity is purely a time factor. It relates to rapidity of room temperature increase and corresponds to "acceleration" in an automobile, while "reserve capacity" of a heater or heating plant corresponds to "power" of an automobile. A hot water heating plant may have more reserve capacity than a warm air heating plant but the latter may have much faster "pick-up." Quick pick-up depends not only upon the reserve capacity but upon the "lag" occurring between lighting the heater and attainment of full heat delivery into the rooms.

If a gas flame directly heats a room, input is almost instantly attained. In a circulating space heater, the heat from the burner first passes into the heating surfaces and from these is transmitted into the room. In a warm air heating system the heater and ducts must first be heated to maximum before full room input is attained. Steam systems involve the heating of the boiler, water piping, and radiators to boiling temperature and in hot water systems, tons of water and metal form a reservoir of heat which must be filled, so to speak, before the full heating capacity is transferred to the rooms. The proportionate "lag" in attaining maximum heat delivery into the rooms is about as follows:

Radiant fire heaters	10 seconds
Circulating room heaters	15-35 minutes
Warm Air Systems	about 50 minutes
Steam Systems	about 2 hours
Hot Water Systems	about 4 hours

The above relative lag should have consideration when deciding upon reserve capacity for rapid pick-up. The Pick-up Chart illustrates the



great gain in responsiveness attained by adding reserve capacity. Curve A shows the room temperature rise when barely enough heating capacity is supplied to attain design temperature and curve B shows the relatively much quicker time in which increase of room temperature is attained—in other words it shows the important gain in responsiveness which reserve capacity gives.

Thermal Efficiency

All vented gas heating appliances of necessity pass more or less heat to the chimney. This is called the "flue loss." In addition to this loss there are two so-called "losses" occurring in central heating plants between the heater input and the room input. These are commonly but inaccurately called the "jacket loss," which is the heat emitted from the casing or jacket of the heater, and the "line loss" which is the heat emitted from the heat ducts or piping between the heater and the rooms. In residence heating plants the heat emission from the jacket and lines is passed into the basement and is thus usefully employed to supply needed heat in the basement to maintain it and the ceiling above it at proper temperature.

The thermal efficiency of a heating appliance is its output expressed as a percentage of its input. (Output divided by input.) In coal furnace and boiler practice it is customary to regard only the heat delivered into the piping or ducts as output. The heat emission from the jacket is therefore regarded as a loss. The A G A Laboratory method is, however, more logical and scientific. This regards only the actual loss (the flue loss) as a loss. The *actual efficiency* of any gas heating appliance will therefore be the input less flue loss, divided by the input, and expressed as a percentage.

The thermal efficiency of a heating appliance will vary at different rates of fuel consumption. Almost invariably the maximum efficiency is attained at a fuel consumption rate less than the maximum rated capacity. At greater or less than most efficient combustion rate, the efficiency curve drops downward but in a well engineered appliance, the drop is not great. In determining the output capacity of a heating appliance we are only concerned with its efficiency at maximum rate.

The operating economy of a heating system depends upon (1) the thermal efficiency of the *entire system* under *average* combustion rate and conditions of service, (2) the efficiency of the heater, radiators, or registers in equally distributing the temperature from ceiling to floor, (3) ample capacity for rapid room temperature advance when required, and (4) accuracy and method of room temperature control.

Heat Distribution Efficiency is determined by the temperature at which heated air is discharged into the room from the heater, radiator, or register. If the necessary B.t.u. room input is attained by discharge of a relatively small quantity of excessively heated air, the air at the ceiling zone will be unduly hot while the air at the floor zone will be uncomfortably cool—even though a thermometer or thermostat at breathing zone may be at 70. This is known as the "cold 70" condition.

The zone which is all important is the "comfort zone," 2½ feet above the floor. Room occupants are usually seated. They live in the 2½ ft. zone and this is the zone which must be comfortable. It makes no difference what the temperature may be in any zone above this or what average room temperature may exist, unless the comfort zone is adequately warmed, the room occupants will not be comfortable.

Large Volume Air Value

If the heat source delivers a relatively large volume of moderately heated air, smaller temperature difference will exist from ceiling to floor, and the comfort zone will be adequately warmed by maintenance of lower average room temperature and proportionately less gas consumption.

As a general rule, space heaters having larger heating surface, have, not only higher thermal efficiency, but deliver larger air volume at lower temperature than inferior heaters, and draw more cooled air from the floor zone. The consequent lowered ceiling to floor temperature difference will therefore result in a gain in operating economy markedly greater than the difference in thermal efficiency indicates.

Thickness of heating surface influences pick-up speed but has no influence upon efficiency.

Reserve capacity to provide quick pick-up is a factor making for economy which is very important in installations where large room temperature drops are contemplated such as in intermittently heated spaces. Ample reserve enables reheating to be done in a shorter period and with less gas consumption during the pick-up period.

The accuracy of temperature regulation is so important that no gas central heating installation is complete without thermostatic control. Equal gains in economy are experienced with space heaters and a thermostatic control valve is recommended for all cases where the heater is the main source of heat supply.

Required Heater Capacity

Space Heaters—To the B.t.u. delivery required to maintain designed temperature in the space to be heated, add 20 per cent for reserve capacity—more or less according to conditions. The output of the heater (input time efficiency) should at least equal this total.

Radiators—The B.t.u.'s. emitted per sq. ft. of radiation is proportional to the difference in temperature between the circulating medium (steam or hot water) and the air in the room. This is modified by the radiator height and the closeness of spacing of the heat emitting surfaces. The Heat Emission Chart shows the heat transmission for various room and register temperatures. A study of the chart will make certain important characteristics clear.

Hot Water Systems of open gravity type are usually designed for boiler delivery of water at 180 degrees and return at 160 degrees, in zero weather. The average radiator temperature will therefore be 170 degrees. The chart shows that at this radiator temperature and 70 degrees room temperature, 148 B.t.u.'s of heat are emitted per sq. ft. of radiator surface per hr. If the system is a closed system under pressure, water temperatures may be employed as high as 200 degrees which will increase radiator emission to 209 B.t.u.'s per sq. ft. hr. when room temperature is 70 degrees.

Steam radiators, being heated to 215 degrees at 1 lb. steam pressure, will emit 240 B.t.u.'s per sq. ft. hr. Note that as shown by the chart, the

heat emission of steam and hot water radiators increases when the room temperature drops. For instance, in the case of hot water radiation, if the boiler has sufficient reserve capacity to raise the radiator to 170 degrees while room temperature is at 40 degrees, the radiator emission is raised from 148 to 209 B.t.u.'s. This flexibility of heat emission makes it unnecessary, in residence heating systems, to add extra capacity to the radiation for pick-up capacity. Steam or hot water radiation can handle added boiler reserve capacity up to 25 per cent without increase in radiation.

Required Radiator Area—Find the heat emission of the type and kind of radiation employed from the Radiator Chart; then divide the heat maintaining requirements of the room by the radiator emission per sq. ft.; the result will be the sq. ft. of radiator area required.

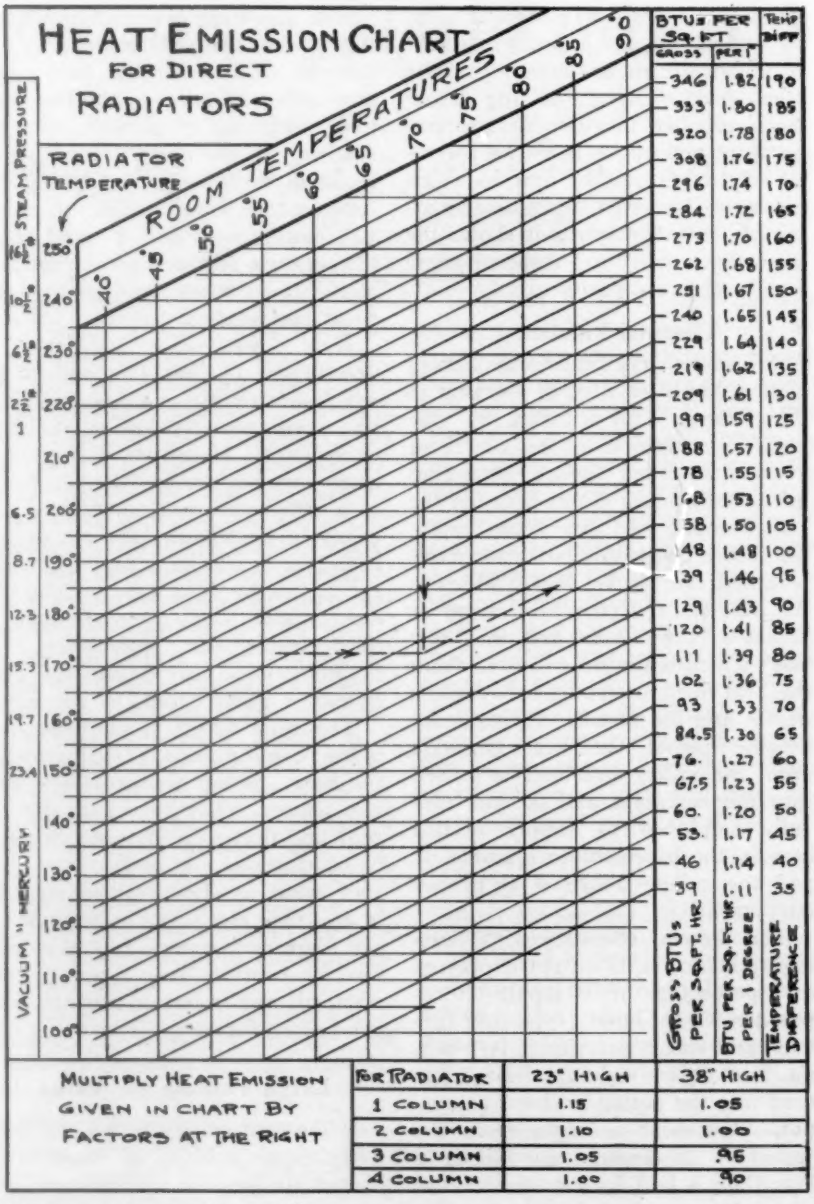
Warm Air Ducts have even greater flexibility of heat delivery than radiators and can easily handle up to 25 per cent reserve capacity. Reserve is therefore added only to the furnace capacity. Calculations for duct and register sizes will be explained in an ensuing section.

Steam Boiler Capacity—For residence work, add to the heat maintaining requirements of the rooms a percentage called the "boiler selection factor" as follows:

Room Losses	
120,000	56%
200,000	54%
300,000	51%
400,000	48%
500,000	45%

The above added percentage includes allowance of about 25 per cent for reserve capacity. The balance is to cover heat emission from the boiler jacket and piping which is relatively larger for smaller heating plants. The boiler input times its *actual* efficiency (input, less flue loss only) should equal the room temperature maintaining requirements plus the above percentage.

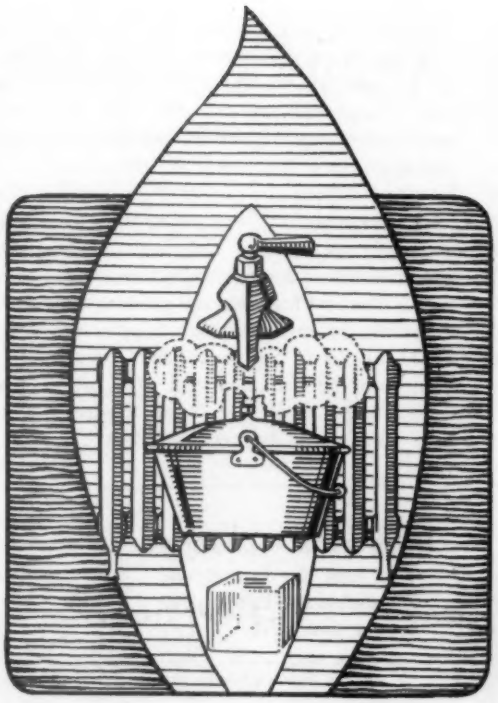
Hot Water Boiler Capacity is usually calculated upon the same basis as in steam boilers, but in view of the slower pick-up of hot water systems, the following is well worth considering:—Add a percentage of equal amount to each of the above selection factors. This will increase the boiler size and cost, but this can be offset by making the system a closed system under pressure which will permit increased radiator temperatures and hence reduced radiator sizes. This with proportionate reduction and saving in cost of the piping will pay for the increased boiler size. Gain in pick-up speed will result from increased boiler size—not from reduced weight of radiation and water.



Intermittent Heating—The foregoing has considered only spaces such as residences. Churches and assembly halls, heated only at certain periods, with no heat in between except to keep pipes from freezing, should have much larger reserve heating capacity, so that quick pick-up may be achieved with smaller gas consumption. In such cases, first calculate radiator and boiler sizes as explained above for residences, then add an additional percentage of reserve capacity to both the boiler and the radiators or warm air ducts. The extra percentage to be thus added is largely a matter of judgment. The following approximate rule will serve as a guide.

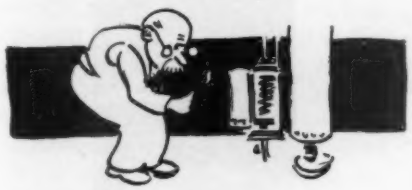
For spaces in which the temperature is permitted to drop and remain at a low point for 36 hours or more, *about* 2 per cent extra reserve capacity may be added to both the central heater and the duct or radiator areas for each degree of drop below 60 degrees. A system such as forced air, having inherent rapidity of pick-up is decidedly preferable for intermittent heating.

The next section of this series will deal with warm air heating, including the new conditioned air heating.—EDITOR.



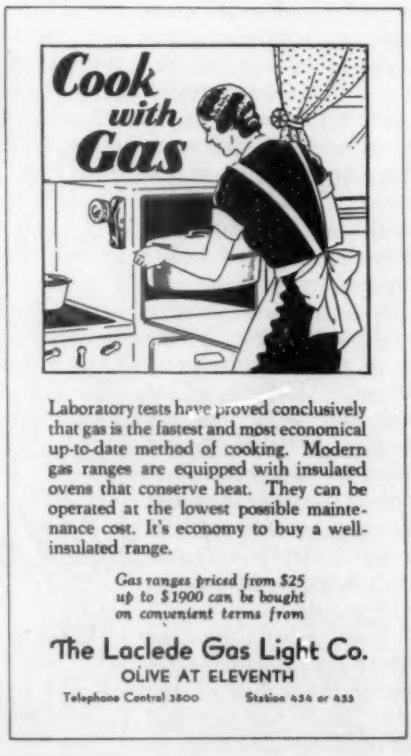
PROFITABLE POINTERS

"A STUDY of human nature will show the gas man that the sale of circulating gas water heaters is still good business. It's not so much trouble for a lot of folks we know (including some gas men) to light and turn off the tank heater as we are sometimes led to believe. It's good business, too, for the simple reason that it brings in a consistent monthly income for the sale of gas; it's just another reason for the home manager to continue with gas for cookery when approached by the man who wishes to convert her to the use of other kinds of heating agents," said a gas man



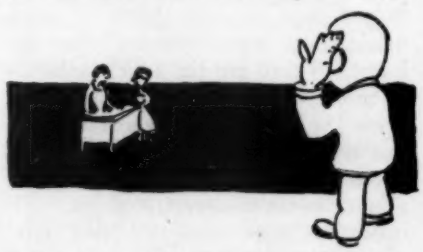
the other day. We think he is correct in this, too. We should do our best to sell everyone who can be made to appreciate the value of automatic hot water service that kind of service, but we should also strain ourselves if necessary to get some kind of a gas water heater in every home. The more uses for gas we have in the home the more the home manager and the man who writes the checks will appreciate it.

INSERTS or "bill flyers" to promote gas cookery are very popular these days and, if you ask me, are very effective. These little reminders do much to keep the home manager sold on the value of gas cookery and when used as they are by the Laclede Gas Light Company, St. Louis, they


Cook with Gas
Laboratory tests have proved conclusively that gas is the fastest and most economical up-to-date method of cooking. Modern gas ranges are equipped with insulated ovens that conserve heat. They can be operated at the lowest possible maintenance cost. It's economy to buy a well-insulated range.
Gas ranges priced from $25 up to $1900 can be bought on convenient terms from
The Laclede Gas Light Co.
OLIVE AT ELEVENTH
Telephone Central 3800 Station 434 or 433

also provoke ideas as to the value of owning a modern gas range.

"ONE reason he don't make good," said a sales manager, referring to one of his salesmen, "is because he's a listener. He spends too much time hanging about the store hoping that he will pick up prospects instead of going out and creating them by calling house to house." A lot of salesmen are that way; however, one way to cure them is for the sales manager to put his foot down on such practice at the very start. One other way to overcome this is an arrangement whereby the outside men are each given a "floor day". Give



each man one day a week on the floor and then check up on the results he obtains: number of sales made, number of prospects secured and such other information as may prove of interest. An analysis of this kind will soon prove to the salesman that the place to make money is out on the street.

AS you read this let your thoughts turn to October with its cool mornings and evenings, and the place portable and fireplace gas heaters may have in the picture. Gas heaters may be sold on a campaign basis

as well as any other gas appliance. A small down payment with the balance spread over a period of six months would be an inducement, and if such a plan were given wide publicity and sales support there's no rhyme or reason why GAS heaters can't be sold in October. For your window display advertisement symbolize cool crisp mornings; a huge cut-out "Jack Frost" will fill the bill. If there's no artist in your organization you can resort to the pumpkin and fall foliage. Plan now to hit for an increased load through the sale of GAS portable and fireplace heaters during October.

PRESTO -- change!
You turn the faucet and the dishes are half washed before you start . . . .
The dishes are stacked, you're set to go and hot water flows. Souse them in the pan, stir up the soap-suds and grease and dirt scamper away down the drain, leaving hygienically clean and self-drying dishes behind.
Know this pleasure, have ever-ready hot water —install a Gas Water Heater in your home. For facts and figures—
Ask Your Plumber or Call at Our Store
ILLINOIS
POWER & LIGHT CORPORATION

HERE'S one of a series of gas water heater advertisements that we recently came upon that uses the cartoon and a short shot of selling copy to put over the desirability of automatic hot water service for the home. There are six advertisements in the series and all of them depend upon the cartoon and short copy to put over the message. It will be noted that the plumber is also given a place in these advertisements. Co-operative advertising of this type should be resultful.

WHILE we are knee-deep in advertising we see more and more gas men turning to advertising to get over the idea of hot water service for the home. Some of these men are using what we are pleased to call "straight" water heating or hot water service advertisements, while others are specific, recommending either the automatic storage type heater or the circulating or tank type. Where the latter is advertised, as near as we can ascertain it is done where there is an urgent desire on the part of management to build up the gas sales per meter without delay; however, we have heard that in other instances the salesmen are instructed to talk the advantages of full automatic hot water service even in cases where the prospect is listed as a prospect for the tank type heater. This means that old-time tactics are in reverse, for formerly the salesman was instructed to discourage the tank heater sale by an offer of $5.00 or so if the customer would yank out his furnace coil and purchase the automatic type heater. Any gas water heater uses GAS.

IT seems to us:

THAT NIRA will banish the chiseler and thus the "tin-stove" competition will disappear from the face of the earth much to the satisfaction of the gas appliance salesman, the service-man and management. The same thing will also hold good with other gyp merchandise that has caused the gas man no end of trouble and caused many otherwise good consumers to become kickers. That gas advertising has got to get into the big league now, and we predict that once it does gas sales will develop so fast that the gas industry will be one of the great advertisers of the future.

That when the gas range manufacturers get under the wings of the blue eagle the national advertising campaign to popularize gas cookery, about which we have dreamed ever since we were "knee-high to a duck," will materialize and become a reality.

THE shadow, or whatever it is that we read about, behind the purchasing agent and the purse is human at that and if your sales talk contains enough of that "what it will do for you", brother he, she, or it, will soon cease to be a shadow and will shell-out. Folks buy largely on that basis, and while writers of books on advertising may suggest any number of appeals, back of it all it's that "what it will do for you" that counts.

GAS home heating is the cause of which a whale of a lot of good advertising is the effect. Such companies as the Laclede Gas Light Company, St. Louis, Equitable Gas Company, Pittsburgh, and the St. Louis County Gas Co., Webster Groves, Mo.—to name but a very few of them—are producing some of the most effective direct mail pieces it has been our pleasure to view: booklets, mailing cards and broadsides such as would cause "Best Advertisers, Limited" to sit up and take notice and read the messages they contain—and from what we hear they are pulling in orders, too, in a most satisfactory manner.

Technical Digest

EVALUATING OIL FOR CARBURETION

The literature on the subject of the analysis and the determination of the physical and chemical constants of carbureting oil, directly translatable into actual use in the carbureter, is first reviewed. Splitting phenomena as applied to gas oil are also studied from the standpoint of their mechanism. The following factors are taken into consideration in determining the suitability of a gas oil for carburetting purposes, namely the temperature of experimentation, the heating period, the physical and chemical properties of the oil under investigation, the pressure of the flowing gases and vapors (the partial pressure on dilution of the oil gas with other gases), foreign gases and catalysts. The experimental apparatus employed is shown in the accompanying illustration. (Figure 1). The oil is fed through the funnel

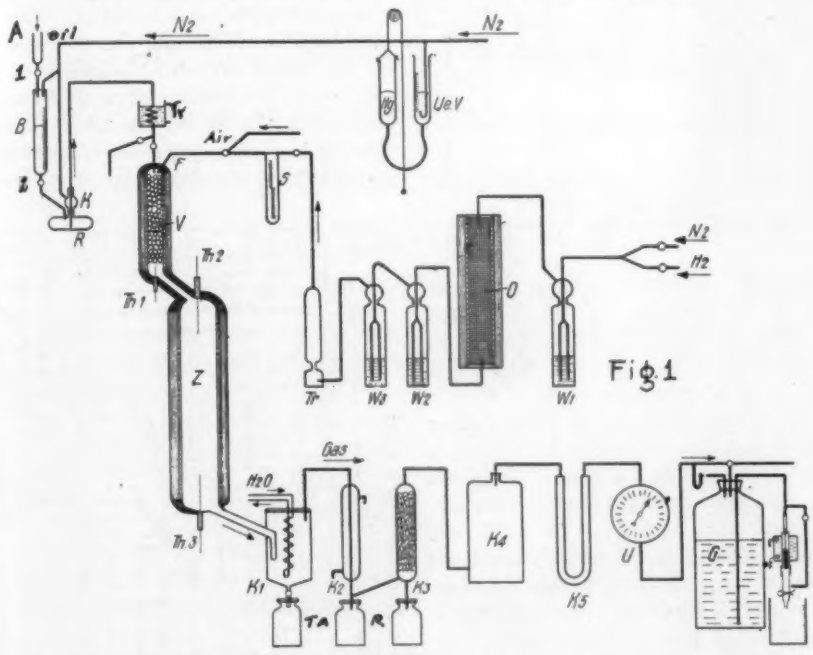


Fig. 1

(A) into the measuring vessel (B). Thence it flows by opening the cock (2) into the container (R), from which it rises into the bulb (K). It is advisable to feed the oil under a slight pressure into the vaporizer, because the sudden vaporization of the oil disturbs the even flow of the same. This is the reason for the insertion of a sufficiently large resistance to flow in the form of a long capillary tube, the internal diameter of which is adapted to the viscosity of the oil, so that the flow of oil can be well regulated by means of a mercury over-flow valve. The greater length of the capillary tube is made in the form of a spiral and is contained in a thermostat (T_r). By proper control of the cocks (1) and (2) and adjustment of the valve (V), the flow of the oil being tested is regulated. Other control devices for the flow of nitrogen and air are also shown. The vaporizer is shown at (Z) and the gases are collected and measured in the various bottles and devices,

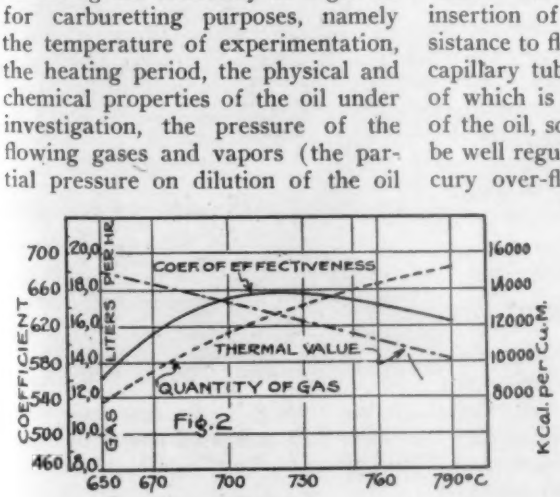


Fig. 2

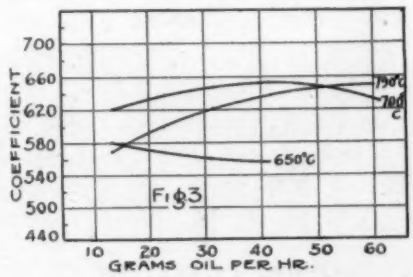


Fig. 3

such as (K_1) (K_2), etc. The gas is metered and collected finally in (G). The gas is analyzed. Numerous results were obtained throughout a series of experiments. The coefficient of effectiveness of the gas oil is expressed as the product obtained by multiplying the quantity of gas obtained per hundred grams of oil by the maximum calorific power of the gas expressed in kilogram-calories per cubic meter. Various gas oils were examined. The relation between the coefficient of effectiveness and various factors controlling the operation of the experimental apparatus was determined. Figure 2 shows the coefficient of effectiveness curve for a definite flow of oil, 31.4 grams per hour, while figure 3 shows the relation between the effectiveness coefficient and the oil flow at various temperatures of gasification.—*P. Schlaepfer and S. Schaffhauser. Monats-bulletin Schweizer Verein von Gas und Wasserfachmaennern, volume 13, 1933. pages 125 to 143.*

GAS HOLDER OIL

A spring loaded device is located on the seals in the gas holder for the purpose of preventing the transfer of oil from the inside to the outside of the holder. This device is used for stabilizing the water levels. Oil to be suitable for use on the gas holder should be distilled twice and should have a viscosity of 150 to 180 seconds Redwood, at a temperature of 21 degrees C. The flash point of the oil should be in the neighborhood of 177 degrees C and the congelation point of the oil should be at —14 degrees C. The oil must not be compounded and must not contain any acid. An oil, possessing the aforementioned properties, will not be viscous enough to stick appreciably to the walls of the holder, nor thin

enough to penetrate the tape seal of the plates. Oil films in holders have been found valuable in destroying vegetable growths. They retard the freezing of water and prevent the resaturation of partially dehydrated gas. They also afford protection against corrosion. Micro-organisms which produced sulphuretted hydrogen from calcium sulphate in stagnant water can be destroyed by the addition of two per cent. of cresylic acid to the oil.—*E. Young. Gas World, volume 98, 1938, pages 10 to 11.*

IMPROVING PURITY OF COAL GAS

The benzol content of the gas is removed by means of activated carbon. A test was made on a 50,000 cubic meter wash oil-benzol recovery installation. Inasmuch as the recovery of benzol with activated carbon can be carried out only in purified gas, so that the activated carbon is not de-activated by the precipitation of sulphur, the gas which is required for the activated carbon installation is purified in a separate installation.

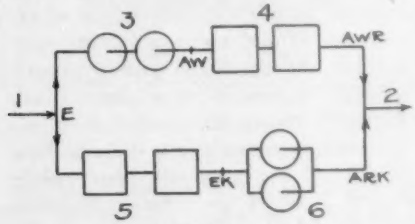


Fig. 1

A comparison was made of the efficacy of the wash oil process and the activated carbon process for purifying gas. A diagrammatic view of the experimental installation is shown in figure 1. The gas enters the experimental installation at (1) and leaves at (2). The flow of gas is divided so that it is purified by means of wash oil in one line and by activated carbon in the other. Thus the wash oil irrigating towers are shown at (3) and the purifier boxes at (4). On the other hand the activated carbon adsorber is shown at (6) and the purifier boxes at (5), the latter being inserted ahead of the activated carbon adsorbers in the line. The designations (E), (AW), etc. indicate the points at which samples of the gas were taken for analysis. The results showed that the removal of benzol from the gas amounted to 67 per cent in the case of wash oil process and 100 per cent, in the case of the activated charcoal process. The sulphuretted hydrogen content of the gas was reduced by about six per cent, by washing with wash oil, while the activated carbon does not have to remove any. The content of organically-combined sulphur is more markedly reduced by the activated carbon process than by the wash oil process. This is understandable when it is called to mind that this sulphur is present largely as carbon disulphide and thiophene, hence in the form of vapors, which are much more effectively combined with activated carbon than with wash oil. Figure 2 shows the adsorptivity for benzol of activated carbon as compared with wash oil at a temperature of 20 degrees C. The complete removal of carbon disulphide by the activated carbon process is of great significance, as it is this impurity of gas that generates sulphuretted hydrogen in the gas mains in the presence of ammonia, causing corrosion of the mains and deposition of iron sulphide. Another important advantage of the complete recovery of benzol from gas by means of activated carbon is that the waste gases escaping from this installation carry no condensable organic vapors. Hence there are no ingredients in the gas which can extract the fats from the leather of the diaphragm in the gas meter.—*Dr. A. Englehardt and Dr. H. Rueping. Das Gas und Wasserfach, 1933, volume 76, pages 478 to 484.*

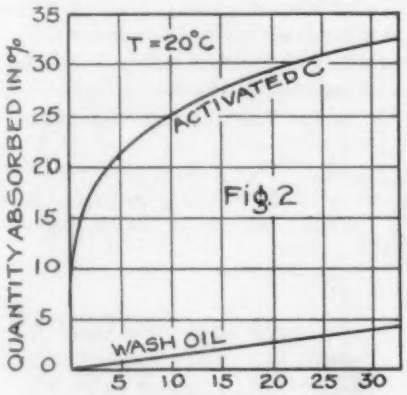
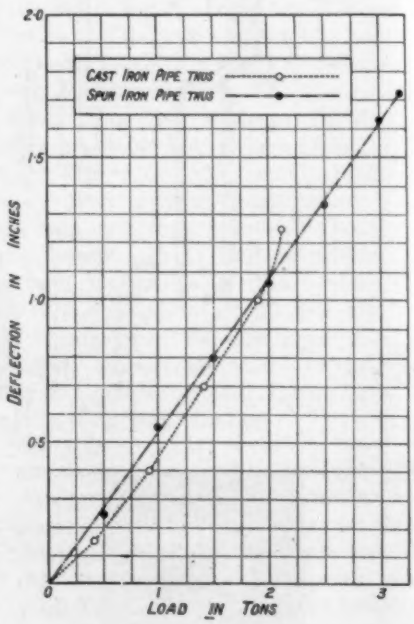


Fig. 2

POINTS IN GAS DISTRIBUTION

While cast iron pipes were used heretofore in the Bristol, England, gas distribution system, spun iron pipes were introduced recently. Tests were made on pipes of equal thickness around the circumference and equally loaded. The results are shown in the accompanying illustration and indicate the more elastic nature of the ordinary cast iron pipe. The importance of the wrapping on steel pipes is emphasized. Hessian cloth dipped into heated bitumen was used. The soil in which the pipes are laid should not be acidic and the trench bed should be free from stones or jagged points. Tests were also made to determine the cost of mechanical caulking of joints as compared with hand caulking. Various factors controlling the corrosion of the mains are also discussed, and means for preventing electrolysis are indicated. In all mains where dust deposit is found, the main is sprayed internally by a portable sprayer. The oil-sprayed gas, travelling forward, deposits an oil film on the inside of the main. The quantity of oil varies, the average being approximately 0.2 gallon per hour.—*G. C. Gunston. Gas Journal, volume 201, 1933, pages 555 to 558.*



RUBBER JOINTS IN GAS MAINS

The rubber rings after sixty years use are shown at the left of the accompanying illustration and rubber rings after two years use are shown at the right. While conditions of exposure had produced plastic changes in the rubber in the first case, the rubber still possessed power of elastic return. Test pieces of rubber

(Continued on page 40)

Notes on High Pressure Gas Distribution

DISTRIBUTION ENGINEER *Discusses Influence of Types of Consumers and Sub-Surface Structures on Development of Distribution System—Construction Details, Gas Storage, Location of Pressure Regulating Control, and Value of Aerial Surveys Also Outlined*

Fig. 7—Variable distances from property line indicated so as to avoid oiled section of roadway and embankments.

THE territory to be served may in general be divided into such classifications as residential, institutional, business and industrial. These broad divisions require somewhat closer observation to indicate sections containing separated dwellings occupied by individual families, those with adjoining residences which are usually of the two or more family type, and those containing considerable apartment houses. In territories where the majority of houses are of the individual family type they may still be further divided into seasonal and yearly occupancy classifications.

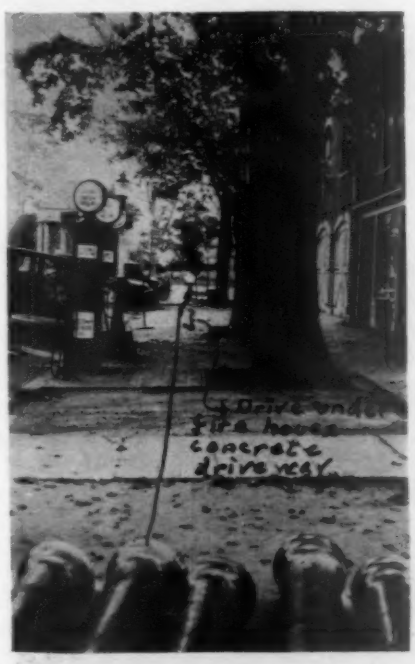


Fig. 8—Tree roots, gasoline tanks, firehouse entrance, full width concrete sidewalks, and water main being installed are difficulties shown.

The small type of seasonal residences usually found in groups ordinarily have a small demand resulting in high investment, maintenance and operating charges for the total consumption. It will be found that the smallest sized main used will serve a much larger number of this type than in sections containing year-round residences. When the seasonal residences are large and occupy estates, considerable care is necessary, since peak demands are high and distances between services great, requiring careful study to produce an economical system. There is also the disadvantage that such consumers are difficult to satisfy and change equipment on the least provocation. Extensions into such sections seldom produce a satisfactory return unless the consumers contribute to or pay for the initial investment. A common arrangement is to return the consumer contribution on the basis of consumption.

It is also important to distinguish between sections where the year-round residences are occupied by commuters to nearby cities, as they are usually larger consumers than local people. There are many ways in which a general knowledge of these conditions is valuable in making decisions on various details connected with the actual design.

While certain types of institutions may be looked upon as a single consumer and, therefore, would require long lengths of main for a single service, the amount of consumption warrants, in many cases, large expenditures. It is impossible for the designing engineer to await securing such institutions as a consumer by the new business department before considering the demand. Even though the main is not installed on the original plans, it is necessary to consider the potential demand when laying out the whole system unless a transmission main actually passes close by.

Business districts ordinarily are not considered as having large demands. In such sections where there are numerous restaurants, bakeries, hotels, tailors and candy shops, the demand may be increased by an active new business department. Some of these types of consumers may be considered an industrial by accounting classification, but the designing engineer must classify demand by streets rather than by accounting practice.

Industrial sections are the most difficult to design, as prediction of load is practically impossible. The attempt should be made to have a transmission line in proximity to the industrial sections so that small

Fig. 9—Indicates method of engineer, showing how measurements are to be taken so as to avoid wide sections of concrete at peculiar intersections.

mains may be placed initially and later easily re-inforced or increased in size. The reconnaissance engineer should be well acquainted with potential loads in such sections requiring not only a knowledge of existing industrial equipment but a vision with which to predict potential uses.

Field Data—Franchise limits are usually political divisions but the survey must determine the physical limits within which field data is desired. Each of the outlying streets will offer a problem as to how far measurements should be carried. While certain rules may exist within each utility giving the maximum length of main allowable or the maximum investment per consumer to apply after a system has been installed and is operating, the initial installation usually exceeds these limits, so judgment is again important. The engineer will require an intimate knowledge of the grouping and spacing of buildings, especially in such conditions as where the average distance between buildings exceeds predetermined amounts, roads on which buildings exist but are not seen when the street is first viewed from intersecting streets, and roads which have but few buildings at present but into which it would be economical to run a stub. By thorough knowledge of these details the engineer may save considerable of the field expense, which is the largest single item in a design, by eliminating unnecessary measuring.

Where there are a considerable number of a single type of building on various streets, the most common practice is to obtain the distances between intersecting streets. In the more sparsely settled sections it is often desirable to secure the distances between each building so that the extent of the line may be determined in the office by indicating the last house to be served. Where particular difficulties exist, as at non-uniform street intersections, full width concrete pavement and sidewalks, a large number of interfering objects such as trees or gasoline pumps, particularly wide streets, interfering geological or topographical formations, etc., notes should be carefully prepared for the field survey crews, and their effectiveness may be considerably increased by the use of photographs on which the desirable details are indicated and the main location is shown by a line.

Extent of Field Data

The policy in determining the extent of field measurements should be to secure the least amount of detail consistent with furnishing the construction crew with all the data required and providing the designers and estimators with necessary details. Usually the amount of field data secured and shown on estimating and construction maps is far in excess of that which is desirable, for the reason that during construction considerable flexibility must be allowed to overcome sub-surface obstructions which the most intensive surface studies can not foresee. The cost of securing an exact location and extent of sub-surface structures previous to construction is not usually justified.

Sub-Surface Structures—As all larger cities have gas service the majority of new territories are villages and towns. The records kept of sub-surface structures by villages and towns have practically no value for those who must trench in highways. The original survey will indicate whether telephones and electric cables have been laid underground or on poles. When underground, those utilities can usually provide fairly accurate locations of their structures or they may be judged from existing manhole covers. Where hydrants are not staggered it is ordinarily possible to predict the side of the street on which water mains lay, or their location can usually be secured from the operators.

The most difficulty is encountered in determining the location and depth of surface drains, catch basins and storm and sanitary sewer systems installed by the villages or towns. In these latter cases the records usually existent are the original prints furnished to contractors and on which no reliability can be placed as to actual installation. The engineer should become familiar with the indications, evident on practically all streets having improved surfaces, of the existence and nature of sub-surface structures for the purpose of instructing his field crews to locate such indications and include them on maps.

Construction—During the reconnaissance survey it is also necessary to establish certain generalities in connection with construction costs for the purpose of determining the features requiring more detailed information. An important feature of construction cost is the remoteness of the new system from established construction bases. Within certain known distances the use of existing crews is preferable, as it is a means of retaining and providing continuous employment for a well trained, efficient organization. Beyond these distances there is a territory which would require much more detailed study to determine the economics of using existing units by considering special arrangements, such as providing free transportation but requiring part or all of the

Fig. 10—Variable distances from property line indicated to secure obstruction advantages.

time consumed by transportation to be on the worker's own time. It would be necessary to compare this scheme with the securing and training of local help.

The availability of local labor is often a seasonal matter; for instance, adjacent to farming areas the spring and fall, and in northern resorts midsummer, are the times of peak labor demand. Mining, oil and manufacturing territories are not generally affected seasonally, but rather by demands for their products.

The use of local labor to the maximum extent is always desirable, often required and advisable because of its effect in spreading a gas attitude and establishing a closer contact than otherwise possible. There is practically no objection to the importation of skilled help when local labor is used.

Where the local labor market is insufficient, both importation and sustenance must be considered. The character of the community affects sustenance of imported labor, as in a resort town during the active season houses are at a premium. Two general plans are available: one, the contracting out to concerns making a practice of housing and feeding a number of men which usually requires a guarantee for a minimum number of men. These catering concerns, being employment agencies, are often a source of labor supply.

An Important Factor

The second plan consists in running a camp as part of the construction work and possibly hiring a qualified man for its supervision. This latter plan is seldom economical, unless the utility has had experience in operating such camps. The many details connected with either of these schemes should be placed in the hands of one experienced with such matters, as it sometimes requires scouring a large territory to locate a suitable building, knowing the economical source of food supplies and sleeping quarter material and how to efficiently organize.

The site of a construction base is an important factor in costs. Its proximity to rail or water terminal unloading facilities, provisions for storing both equipment and material, existing buildings for office, inside storage, garage and repair purposes and nearness to actual construction must all be considered.

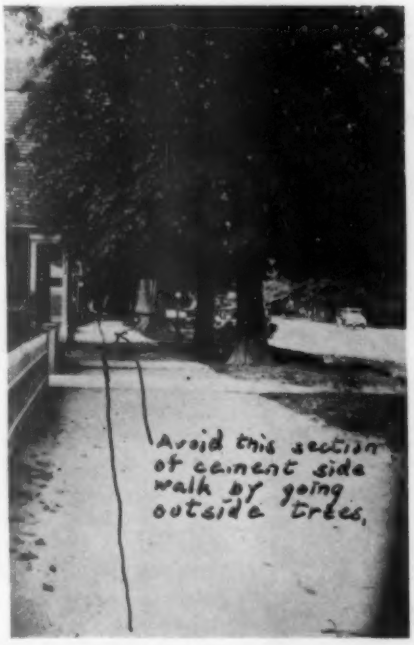


Fig. 11—Change in distance from property line to avoid concrete sidewalk and also tree roots.

The transportation of material is a subject often receiving less attention than its importance warrants. If the construction area is in an inland town, the fact that a railroad is the only visible sign of transportation usually results in the assumption that its facilities must be used. Often a study of water transportation combined with trucking results in definite economies. With water transportation it is usually necessary to purchase material in larger lots than would be the case with rail shipment.

Where possible the trucking of material has many advantages. Delivery may be had in small quantities resulting in a greater spread of costs which on large jobs may result in an economy. Truck delivery direct to the immediate work in progress eliminates demurrage, additional unloading, storage and handling charges. When trucking facilities are sufficiently dependable to provide uniform receipt of material delivered direct to the work, there is also the elimination of deterioration of large stocks and less damage from numerous handlings, although this latter may be effected by poor care during truck transportation.

Details for Construction Crews—An overabundance of detail furnished to a construction crew is not only costly to secure but loses its value by detracting from interest and thoughtfulness on the part of those supervising each detail of the construction. A few details may easily be kept in mind by construction supervisors and utility inspectors, whereas large quantities are easily forgotten and lessen the importance of those absolutely necessary. An example is the general lack of knowledge of vehicular laws by the average driver who prefers to use his own judgment, which often is more valuable than technical details of existing laws and should be encouraged by instilling a sense of responsibility for the carrying out of broad policies rather than compelling adherence to numerous rules and regulations.

An Impractical Rule

One of the hardest rules to formulate in the type of towns being furnished with service now and in the future is the designation of a definite distance from property line to the main. Such a rule is not only impractical but impossible to follow. The engineer must secure a general knowledge of how definitely property lines may be established by observation in the field. Where not definite, the value of establishing the lines by survey adds the further decision as to whether such work should be done by the original survey crew or by the construction department just previous to actual installation. The value of establishing property lines is a matter having only judgment as a basis. On many streets properties have been held for considerable periods by single families, so that recorded data is indefinite and open to dispute. Under such circumstances expensive searching and surveys are not economical and the utility should lay its mains along the beaten section of highways, with the tendency to place a main closer to the possible location of sidewalks than to improved surfaces of the roadway proper to avoid being under the road surface improvements when made. Although this plan may result in a few necessary relocations in the future, the cost of establishing property lines will generally be found expensive, without compensating returns and to exceed relocation costs. A decision on this matter also affects the method of securing records of the

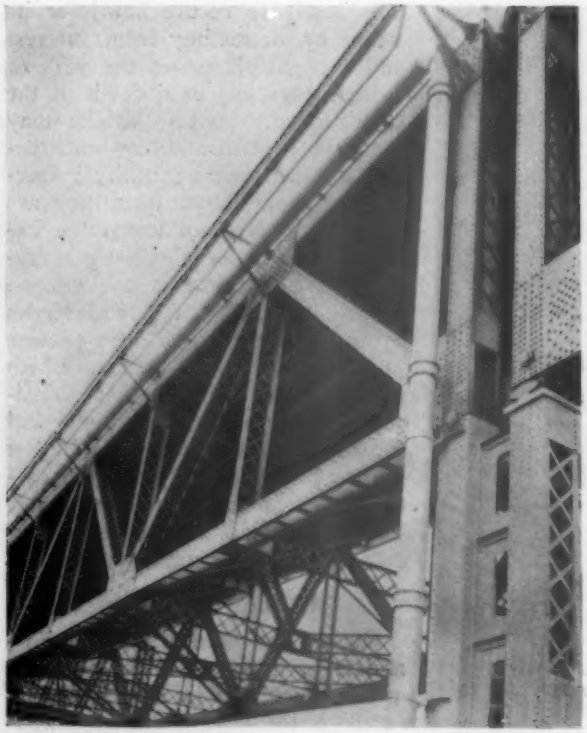


Fig. 12—Indicates better than a blueprint the details of a bridge necessary to secure when designing hangers. These hangers are of a simple type.

completed mains, as without definitely established property lines the detail location in plan is more difficult. Progress may often be delayed by the difficulties of property line determinations.

When unmonumented property lines are not to be definitely established it will be necessary to select objects and lines with as great permanency of life as possible for the basis of permanent records. This will be found particularly difficult in many sparsely settled streets and warrants close observation with detailed instruction on the part of the engineer.

Miscellaneous Obstructions—Such obstructions as bridges, railroad crossings and other man-made interferences require much more study and planning than the majority of difficulties encountered. When dealing with railroads it is usual to establish contact with one definite person from whom a decision on submitted plans may be obtained without unnecessary delay. Such a person would be sympathetic with the problems of a utility. In the case of public bridges, however, practically all are supervised by departments under the control of political bodies which will necessitate a closer examination and more intimate knowledge on the part of the engineer than required on a railroad crossing. Appearances are ordinarily considered more important than strength and convenience.

Storage of Gas—The necessity or likelihood for high pressure gas storage at or near the distribution system requires few mathematical computations when compared to quantity which is not a problem of reconnaissance. If storage will be necessary its location and method of control must be decided, as that point is in reality the beginning of the distribution system.

The most difficult problem to decide in connection with storage is the amount which shall be installed as a service factor of safety, especially where normal operation does not require storage. Unless transmission facilities are known to be unreliable and undependable, storage should not be erected merely to provide a factor of safety. The gas industry by widespread publicity and years of background has established a reputation of continuous service, but has done so in many instances at an expense that affects rates more than is desirable or warranted. The policy should be to install the most reliable transmission system possible to eliminate the necessity of a service factor of safety such as provided by storage. The highly problematical possibility of lack of storage resulting in a district without gas possibly once in its entire existence—which would necessitate the cost of notifying, turning off, turning on and again notifying consumers—is becoming more and more remote with the establishment of well designed transmission and distribution systems.

Pressure Regulating Control Location—When the pressure regulation for a distribution system is not installed at the storage, its location is not necessarily a vital reconnaissance survey problem, as it may readily be placed in a pit built anywhere along the line feeding the distribution system, even though that may result in a portion of the consumers being on the higher transmission pressures. However, if above ground, its location must be definitely established previous to securing field data and design. The location of pressure regulation will usually be combined with the district meter.

Aerial Survey—The use of an airplane for observation and securing pictorial records of a territory has many advantages, an important one being the ability to secure a complete plan without arousing the curiosity attendant with measuring along each street. No other method will give the degree of accuracy possible with an aerial map in such short time. An aerial map is especially valuable where a preliminary estimate is desired for a number of small prospective territories.

Value of Aerial Maps

Considerable detail may be secured from an aerial map by one accustomed to interpreting photography. The average person accustomed to standard outline drawings finds difficulty at first in picking out the desired points because of the inclusion of so many and varied details in a photograph. Those who have become accustomed to aerial maps are enthusiastic about their advantages and do not return to drawings unless necessity dictates.

Often it is difficult to secure a drawn map which accurately outlines the plan view of highways. An aerial survey will clearly show the course of highways and is particularly valuable in showing streets which intersect after paralleling each other for long distances, the course of roads which continue for a considerable length past existing buildings but along which future development affects distribution design, the actual extent of development in recent real estate divisions and other highway peculiarities

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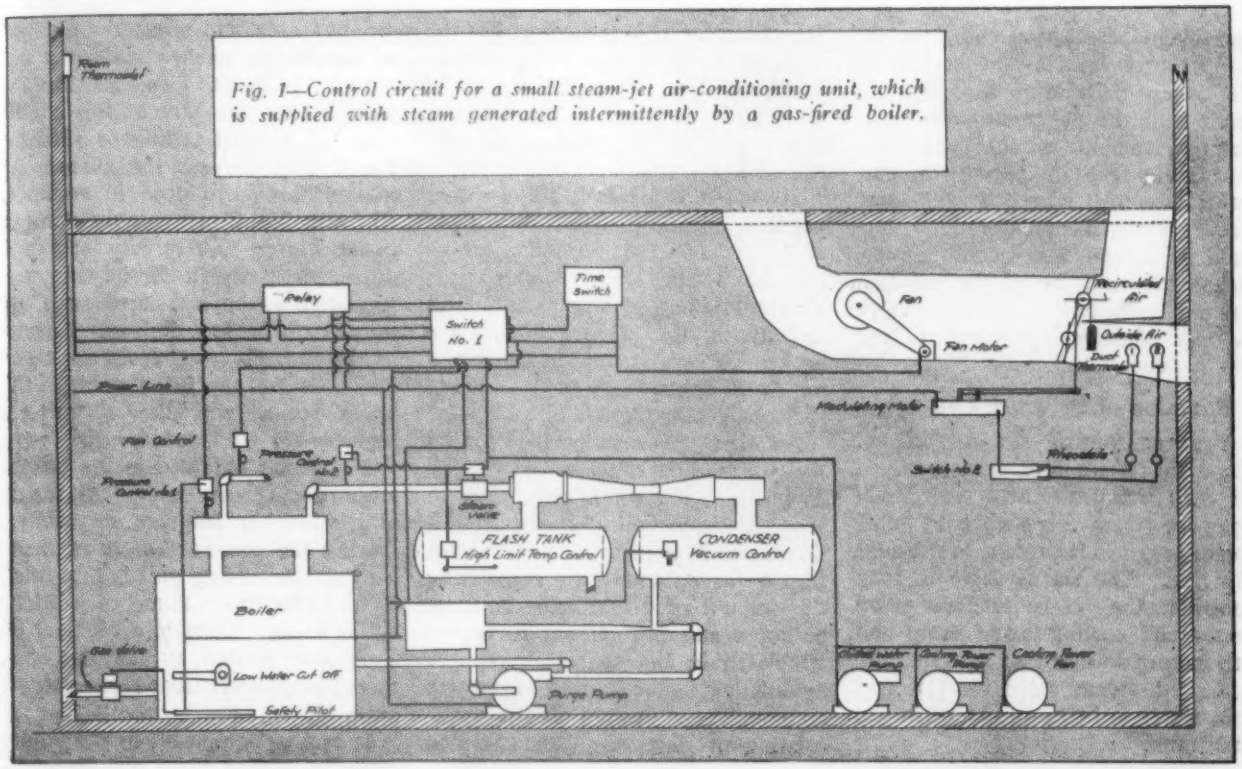

Fig. 1—Control circuit for a small steam-jet air-conditioning unit, which is supplied with steam generated intermittently by a gas-fired boiler.

Automatic Control for a Steam-Jet Air-Conditioning Unit

By R. R. HOUSER

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CONTROLS are one of the most essential parts of any air-conditioning system, yet frequently too little attention is given them. They play as important a part in the operation of the system as the nervous system does in the human body. Failure to use adequate control equipment means failure in the results obtained.

One of the handicaps in the application of the steam-jet refrigeration principle to air-conditioning has been in the method of control. Steam has been used successfully for many years for producing cold water for process, drinking, etc.; in most of these applications a constant supply of steam is available. Now it appears that steam-jet cooling may be the solution for summer air-conditioning in many offices, stores, shops, residential buildings, etc., with the boiler which supplies steam for heating in winter also supplying steam to produce cold water by means of the steam-jet principle for air-conditioning during the summer months. Cost of operation will be one of the determining factors.

Generation of steam for a steam-jet intermittently, only as cooling is necessary, can effect a considerable saving. The average owner or supervisor of a small plant who expects to maintain the proper temperature summer and winter will set a thermostat indicator occasionally, but he will not give any more time to adjustment; he requires automatic operation.

The wiring for a 6-ton steam-jet conditioning plant shown in Fig. 1 is giving satisfactory results in a small Kansas City store. Natural gas is the fuel used in the gas-designed boiler supplying steam for cooling the same area in the summer that is heated in the winter.

Units using only one steam-jet must have a purge to create the initial vacuum before the unit is ready to receive the live steam. Otherwise, the steam would flow into the evaporator and heat the water intended to be cooled. The first stage in the cycle of operation then, must be the creation of a sufficient vacuum in the evaporator or flash tank so that the steam may pass unrestricted into the condenser as the steam valve is opened.

The primary control is a room thermostat, placed in the conditioned area, in command of the purge-pump motor through a relay

Courtesy of Heating, Piping and Air Conditioning—August, 1933, issue.

and magnetic starting coil. As the temperature rises to the setting of the room thermostat a contact is made and the purge commences to pump a vacuum on the evaporator and condenser. One part of the gas-valve circuit is closed at the same time. When a predetermined vacuum is reached, the vacuum control closes the final break in the gas-valve circuit and allows this valve to open thereby supplying gas for steam generation.

Function of Pressure Controls

Pressure-control No. 1 will not allow the steam pressure to exceed 15 lb. Pressure-control No. 2 will open the steam valve when 13 lb. of steam pressure is present in the supply line. The steam valve in turn controls the chilled-water pump motor and cooling-tower pump and fan motors so that they operate only when the steam valve is open and cold water is being produced in the flash tank.

If, for any reason, steam should cease to flow through the jet and, instead, into the flash tank, the high-limit control will immediately close the steam valve.

When the room thermostat is eventually satisfied, its contact is broken, the holding relay breaks the gas valve and purge-pump motor circuits simultaneously. Since the gas supply is cut off, the boiler ceases to produce steam and pressure-control No. 2 closes the steam valve on loss of pressure. The steam valve stops the cooling-tower and chilled-water-pump motors. The same cycle is repeated on the command of the thermostat.

Winter air conditioning can be had by reversing switch No. 1 and opening the hand valve on the pipe supplying steam to the heating coils in the conditioning unit. The action of the thermostat will be reversed to make a contact on a drop in temperature. A circuit will be made then through the relay and pressure-control No. 1 to the gas valve, allowing steam to be generated and supplied to the heating coils.

The fan in the conditioning unit supplying air to the conditioned area is controlled by a time switch. Continuous operation of the fan is necessary for air circulation when the building is occupied. During hours of no occupancy at night, control of the fan automatically reverts to the fan control. This control makes the fan circuit only as steam is produced by the boiler. At a predetermined hour in the morning the time switch makes a circuit to provide again constant fan operation.

If switch No. 1 is in the summer position, the time switch serves another purpose. At the time corresponding to the hour in winter when air conditioning was not wanted, all circuits of the steam-jet unit are broken. A certain time in the morning is set for circuits to the cooling system to be made again.

As there are many periods during the year when outside air can be supplied to the conditioned area to supplant the action of the air-conditioning unit, a method is shown in Fig. 1 for automatically controlling the amount of air brought in from outdoors and the amount to be recirculated in the space served. A modulating motor is used to operate an outside-air damper and a recirculating-air damper. Duct-thermostat No. 1 controls this motor in summer; by reversing switch No. 2, the second duct thermostat commands in winter.

Action of Summer Thermostat

The summer thermostat is so wound as to give one-half of its action, or a ninety-degree motion, between 70 and 80 F, and an additional ninety-degree motion between 70 and 65 F. If the outside temperature rises from 65 F to 70 F, the outdoor-air damper will rotate from a closed or vertical position to a full-open or horizontal position. The damper position is at any time in direct proportion to the temperature between 65 and 70 F. Similarly, the action from 70 to 80 F is from the full-open position on up until the damper is closed. The entire motion from 65 to 80 F is through a one hundred and eighty-degree arc. The recirculating damper is always in the reverse position in comparison with the damper in the outside-air duct.

The winter duct thermostat placed in operation by the reversing switch allows the outside-air damper to move from a full-open position at 65 F to the closed position at 30 F. The same relation exists between the damper position and outside temperature as is maintained by the summer duct thermostat.

The number of people in the conditioned area will affect the amount of outside air needed when the occupancy is great. Two rheostats are provided to take care of this condition. A manual setting of rheostat No. 1 will increase the amount of outdoor air introduced in summer. Rheostat No. 2 controls the damper in the winter. There may be a time during each day in the heating season when a complete "airing out" of the area served is desired. A turn of the rheostat stops recirculation of inside air and the full opening of the lower damper will allow a complete replacement with outdoor air.

The result obtained is the proper proportioning of outside to inside air, either in summer or winter. During the cooling season an overload on the cooling unit is prevented by reducing the volume of outdoor air entering. Outside air below 65 F is also limited so that on cool, rainy days, recirculated air only is used.

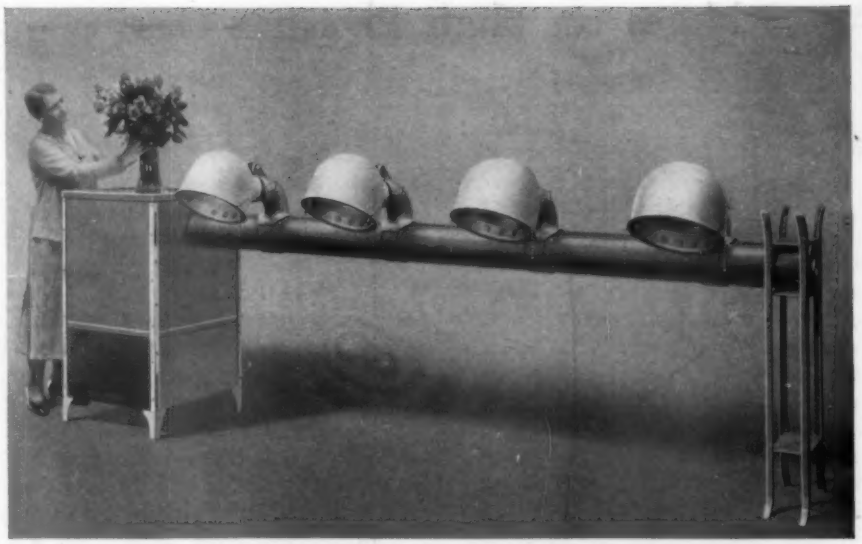
If cooling equipment of the proper capacity is used there should be no complaint because the inside air is too warm for comfort. The low-temperature point should receive the most attention. Air conditioning has been severely criticized because the area conditioned was cooled too much. Cooling units with balanced capacities will allow the inside temperature to rise almost in direct proportion to an outdoor-temperature rise, maintaining approximately the same differential. This will aid in eliminating the body shock experienced when a person first passes into the space cooled, or upon going into the hot street temperature from a too-cool space.

What Results Indicate

1. A small gas-fired boiler supplying steam for heating in the winter and cooling by means of a steam jet in summer can be operated most economically by generating steam only as heating or cooling is needed.

2. Correct proportioning of outside and inside air will materially aid in raising the efficiency of an air-conditioning unit.

3. Control of the minimum temperature inside with relation to outdoor temperature is essential to producing comfort conditions. The maximum indoor condition will take care of itself if the cooling equipment is controlled by a room thermostat.



This equipment is used in beauty parlors for hair drying, through the medium of gas-heated warm air.

Beauty Parlors-An Undeveloped Source of Revenue for the Gas Companies

EVERY gas company executive realizes that the future prosperity of his company depends upon the conclusive proof of the fact that gas is the most modern and most efficient source of heat for every purpose. For this reason it is of immeasurable importance that new markets be opened that not only have good load building possibilities but also have a strong tendency to promote the use of gas for other purposes. The beauty parlor industry is an outstanding example of this type market.

Due to recent developments it is now practical for every beauty parlor to replace their electric hair dryers with a dryer using gas as its source of heat. This step will not only lead to greater satisfaction for the shop's customers but will also save the beauty operator money. The gas companies that help develop this market will profit by the increased load and the promotional advantages of replacing electricity with gas.

Let us look at the promotional possibilities first. The average housewife's long experience with gas as a means of cooking has, through familiarity, dulled in her mind the advantages of this fuel. This mental attitude has been augmented by the "ballyhoo" of the electric range manufacturers. Yet this same housewife may be sceptical of the advisability of installing gas for any or all of its other domestic uses, both because of its newness and because of her lack of information on the subject. These two doubts, so extremely opposite in nature, must be overcome by the gas companies. A beauty shop using a gas hair dryer is a powerful and practical argument in favor of gas. Every woman will know that this task was formerly performed by electricity. She will be sure to notice that the gas dryer is automatic—the operator has only to turn a switch to start the flow of warm air. The speed of operation and the fact that the drying process did not raise the temperature of the room will immediately impress her. The favorable reaction of this woman to this modern and efficient appliance cannot help but go a long way toward overcoming any doubts she might have as to the desirability of using gas for cooking, water heating and house heating.

If this new market is developed extensively the gas companies may expect an added income of approximately 15 million dollars a year. This revenue may be obtained without adding to the present overhead of the gas companies. Every beauty parlor uses gas for heating marcel irons, etc. However the consumption of gas at this time by the beauty industry brings very little if any net return to the gas companies. The installation of gas hair dryers, as stated above, will not add one cent to the gas companies' overhead but will increase their income from this class establishment by one thousand to fifteen hundred per cent. This increase will turn the beauty parlor into a very valuable customer instead of one on which the gas company is merely breaking even or perhaps actually losing money.

Until approximately a year ago there was no gas appliance on the market which could satisfactorily compete with electric dryers for this business. There is now available a machine which can be sold on a performance as well as on a fuel saving basis. The machine is completely automatic and has been found foolproof by the laboratories of some of the largest gas companies in the United States.

Cultivation of this market is making some progress in the middle west and southeast and with proper gas company cooperation the next few years should find every modern beauty shop using this advanced method of hair drying. It is to the distinct advantage of every gas company to cooperate in the development of this new market in order to displace as rapidly as possible the electric appliances now being used.

Notes on High Pressure Gas Distribution

(Continued from page 36)

which become distorted after considerable scaling on drawings.

While the height of buildings is difficult to secure, yet the actual number and location of existing structures is clearly shown which simplifies field work. The concentration of buildings is easily determined from an aerial photograph, materially assisting in limiting the territory and excluding the possibility of overlooking a group of buildings more or less isolated from other groups, yet, due to the concentration, warranting service.

By making periodic photographs of each section the rate and direction of growth are economically determined. Such periodic records are valuable for predicting future weak points of a system and have indicated their value in rate cases.

For reconnaissance work the extent of landscaping is distinguishable to any desirable degree by the simple procedure of enlarging the photographs to indicate that particular detail.

The accuracy with which distance may be scaled from the aerial maps depends on the degree of enlargement and the flatness of the territory. In particularly hilly sections an average grade could easily be assumed or even secured from highway departments from which the scaled figures could be increased to correspond. Vertical dimensions may be obtained by aerial photography by means of oblique photographs which are more expensive. This method is more complicated than usually desired but produces main lengths within the accuracy demanded in a preliminary survey. Oblique photography also results in the heights of buildings being evident.

Major difficulties such as rivers, valleys, railroads, bridges, etc., are shown with greater evidence of their effect on design than would result from any other method.

The cost which at present varies over wide limits, depending on the section of the country and whether the utility owns and maintains its own plane, must be based on the value of the information obtained. More extensive data is secured than by any other method and the record secured is excellent for permanent filing. More territory may be included than would be warranted on a ground survey at a reasonable cost. A photograph permits a thorough and intensive contemplation of a project in an office. The cooperation of those who cannot find time to go into the field may be sought and a clear picture of conditions placed before them. As a policy, a pictorial representation is preferable since it provides more active thinking than word descriptions.

The time to complete an extensive aerial survey is less than the securing of an equal amount of details by ground methods. At the time of securing such a record for purposes of transmission line design and acquiring of right-of-ways, there is but slight additional expense added by extending the survey to include all possible distribution requirements within a reasonable distance on each side of the proposed main. There is the disadvantage that to produce best results it is necessary to select particularly clear days having favorable atmospheric conditions for aerial photography. Clear photographs may be secured even on foggy days with the use of special filters, although they are more costly at present.

Aerial photography is not as valuable for the recording of city conditions as it is for surburban and rural, although its use is not uncommon for city mapping where it can be combined with aerial work of all natures on large systems.

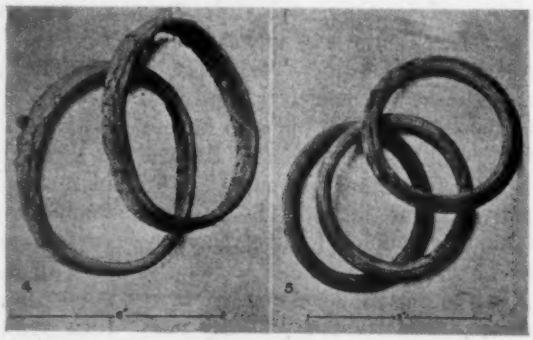
Where the expense of a complete pictorial record is not considered warranted or when it is necessary to hire a commercial plane and photographers for a particularly small area, there is a distinct advantage to the reconnaissance engineer making observation trips. Photographs taken with an ordinary camera on such trips will often eliminate the necessity of additional field tours for information not originally noted.

Some cities, counties and towns have had aerial maps made of their territories which can usually be secured but, not having been made specifically for utility work, may not have the full value of a special survey.

Rubber Joints in Gas Mains

(Continued from page 32)

were prepared from the rings in the form of thin narrow ribbons and of flat plates 10 to 15 mm. square. The elasticity was investigated by extension and compression tests. High power of elastic return was possessed by the old ring. There was greater effect of time on the behavior of the old ring, whether duration or stretch or duration of recovery. As far as elastic return after compression was concerned, both old and new rings were good and the material from the old ring showed greater power of



elastic return and a relatively greater time effect. Cuttings from the rings were immersed in benzene at 25 degrees C. They absorbed near equally and about 3.5 times their own volume, as the swelling maximum in a test of about 400 hours' duration. As the materials were, before immersion, already impregnated with substances absorbed from the gas, the actual swelling figures cannot be usefully compared with those for normal new compounds. But it is worth while noting that the test samples retained their form and showed no signs of deterioration.—*Gas Journal, volume 201, 1933, pages 809 to 810.*

Experience With The Ignition Arch Carburetor

By HENRY M. RILEY
Editor, AMERICAN GAS JOURNAL

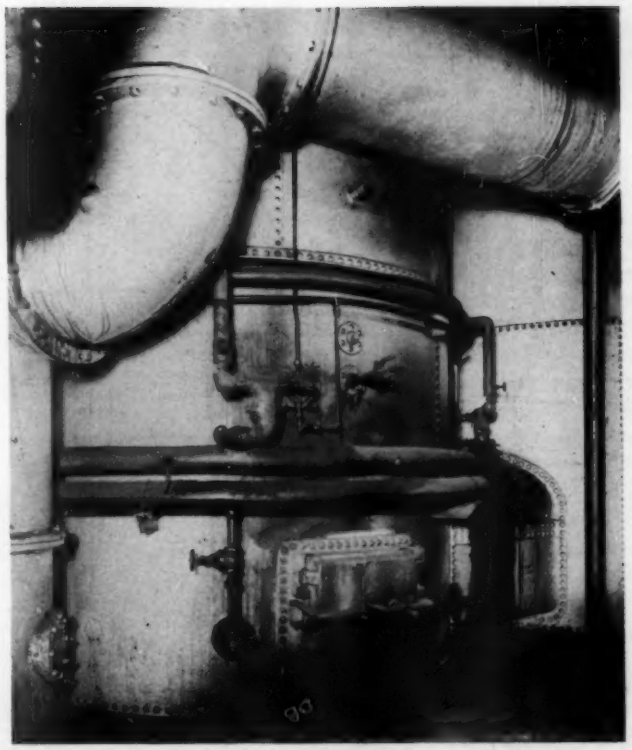


Fig. 1—Exterior View of Ignition Arch Carburetor
The carburetor is shown with the scurfing air, oil and steam piping

THE installation last May, of a Semet-Solway ignition arch in the carburetor of one of the water gas sets at the manufacturing plant of one of the large New England gas companies, was prompted essentially by the desire to obtain considerable flexibility in the operation of the set insofar as oil and solid fuel are concerned.

The installation of the ignition arch answered this problem in that, when the supply of stock coke (the company markets its surplus coke in the territory it serves) increased, the proportion of coke supplied to the generator could be increased and the heavy oil cut back. This lessening in the use of oil would take place in the generator where an oil spray head supplies oil for the back run. On the contrary, when the supply of coke would decrease, the amount of oil would be stepped up. The increase in the use of oil would be brought about by supplying more oil at the generator spray head for taking care of the back run. In this case the increase in the use of oil in the generator would deposit more carbon on the fuel bed and thereby take up the deficit accruing from the lessened use of coke. Incidentally, when the arch was first put into operation, 40% of the oil fed to the set was sprayed into the generator and 60% into the carburetor per cycle. At the present time, 37% enters the generator and 63% the carburetor. Since the installation of the arch several months ago it has been found that the desired flexibility and savings have been realized.

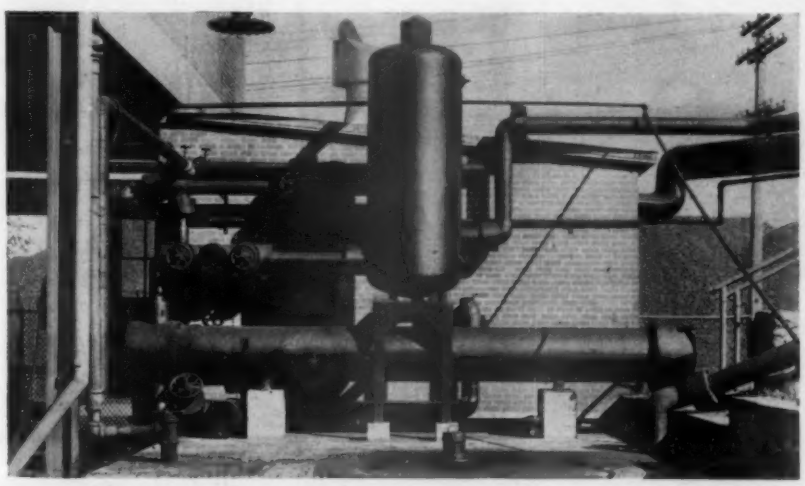


Fig. 2—Heavy Oil Heating System
This view shows the heavy oil heater and above, the oil magazine, through which the heated oil passes on its way to the water gas machine

The handling of the heavy oil had best be described before dealing with operating results.

The oil is usually received on a siding in tank cars from which it is pumped to a storage tank with a capacity of 200,000 gallons. This tank, which was formerly the pit of a gas holder, might be styled the primary storage. In addition there is a 10,000-gallon tank which will be called the secondary storage. Incidentally, at more or less frequent intervals, oil is delivered to the secondary storage by way of tank trucks.

In order to render the oil in the tank cars more fluid, so as to facilitate pumping, steam coils located in the cars heat the oil to about 90-100 deg. Fahr. Further, the primary storage is fitted up with steam-fed coils, the same only being in operation dur-

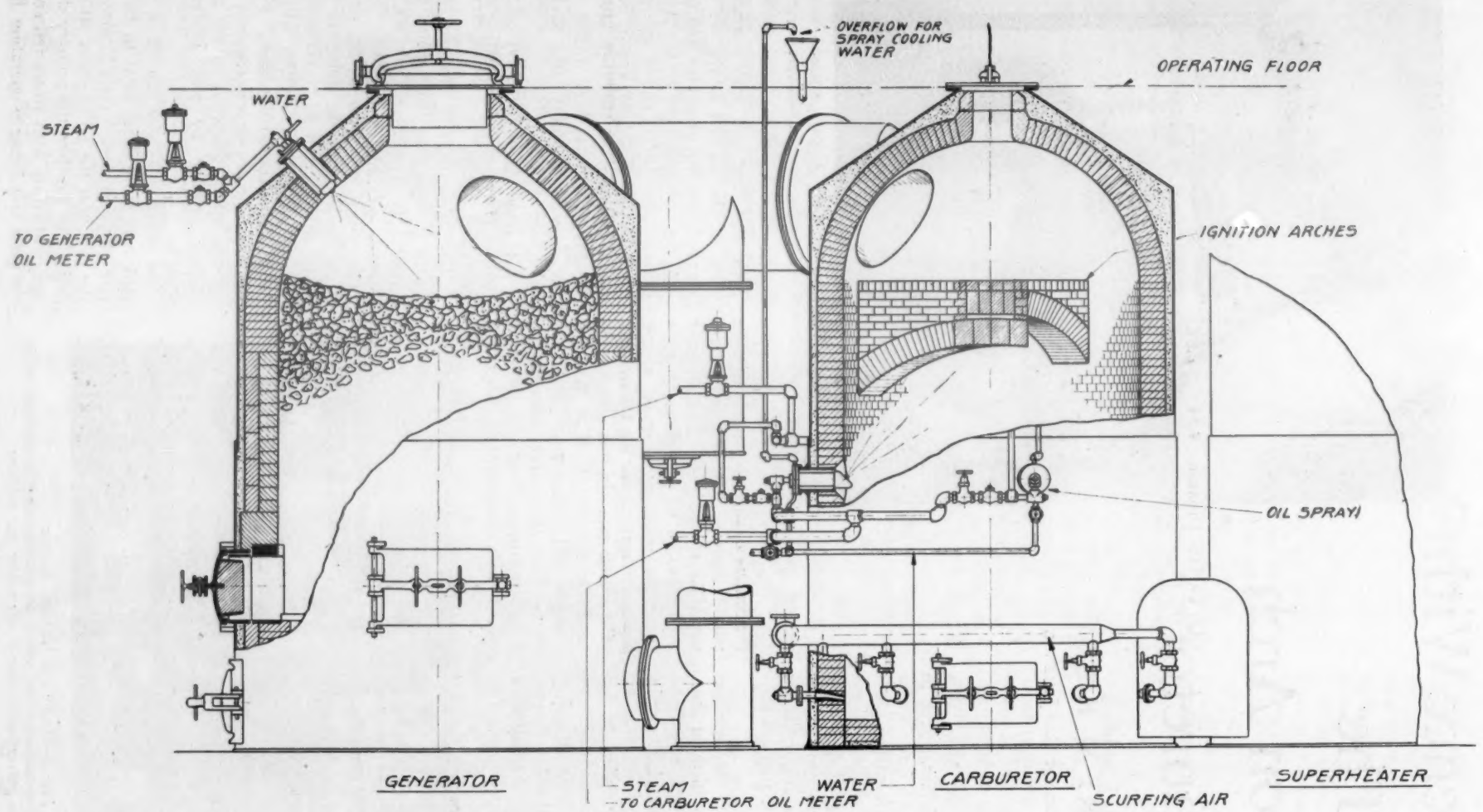


Fig. 3—Diagram of the Semet-Solvay Ignition Arch Process for Carbureting Water Gas with Heavy Oil

The generator is shown equipped with an oil spray for introducing heavy oil into the generator during the backrun. The carburetor shows the location of the ignition arch, the arrangement of the oil sprays below the arch, the air scurfing manifold at the base of the carburetor for burning out carbon deposits, and the necessary purge and other piping.

ing the cold weather. From time to time the oil is pumped from the primary storage into the secondary storage. From the secondary storage the oil is pumped through what is known as a secondary heater where a temperature of about 300 deg. Fahr. is maintained and thence proceeds to the spray heads on the water gas set. The secondary heater, which derives its heat from steam, maintains the temperature of the oil at the desired point through the medium of two thermocouples which control the steam supply. This secondary heater is located out-of-doors and operates on discharge; the primary heater located in the bottom of the primary storage tank, operates on suction.

The vertical retort coke used in the generator has the following characteristics:

Moisture	0.81	per cent
Volatile Matter.....	5.36	"
Fixed Carbon	86.27	"
Ash	7.56	"
Sulphur (dry basis).	0.52	"
Cell Space	58.3	"
Fusion Point of Coke Ash	2340	deg. Fahr.

The heavy oil has the following analysis:

Gravity at 60 deg. Fahr. A.P.I.	.91 or 22.7
Viscosity, Engler	122 deg.. 49 sec.
Carbon Residue by Weight, Conradson	4.3
Flash Point, Open Cup....	300 deg.
Sulphur, by Weight.....	0.55
Sediment, by Weight, Benzol Abstraction	.04
Approx. B.T.U. per gal.	146,000

Gas Making Materials

The gas-making materials used before and after installing the ignition arch are as follows:

	Using Gas Oil	Using Heavy Oil
Period	4 months	2 months
Coke per M....	25.5 lbs.	14.2 lbs.
Oil per M.....	3.42 gal.	4.20 gal.
B.t.u. content of gas	538 per cu. ft.	546 per cu. ft.
Tar per M of gas made	0.66 gal. (actual)	1.2 gal. (est.)
Percentage of oil admitted per run per cycle.	100% in carburetor	37% generator (back run) 63% carburetor
B.t.u. efficiency	65.7%	67.3%

The B.t.u. efficiency has been calculated from the following formula:

$$\text{B.t.u. Efficiency} = \frac{\text{B.t.u. Water Gas per 1000}}{\text{Lbs. Coke per M} \times \text{B.t.u. per lb. Coke} + \text{Gal. Oil per M} \times \text{B.t.u. per gal. of Oil}}$$

The analysis of the gas, before installing the ignition arch, with the usual gas oil and after installing the ignition arch, with heavy oil shows the following:

	Using Gas Oil	Using Heavy Oil
CO_2 Carbon Dioxide.	4.54	2.89
C_mH_n Illuminants ...	10.85	8.85
O_2 Oxygen	.60	.54
CO Carbon Monoxide	20.30	17.18
H_2 Hydrogen.....	43.90	52.30
CH_4 Methane	13.87	13.00
N_2 Nitrogen	5.94	5.24

As regards gravity for May the coal gas showed .521 and the water gas .622; in June the coal gas gravity was .554 and that of the water gas was .670.

Promoting Efficiency

In the ignition arch process the conditions that make higher efficiencies possible are:

1. The oil is fogged into the carburetor countercurrent to the flow of gas. Therefore the oil particles are continually passing into a new atmosphere of gas until the oil is gasified and loses its velocity.

2. As no oil is sprayed into the top of the carburetor as in standard practice, there is no dark cloud to prevent heat radiation from the dome and upper part of carburetor. The gases coming from the generator, therefore, carry the heat of radiation down into the carbureting zone.

3. The temperature in the carbureting zone does not fluctuate through as great a range, as a result of the function under Item 2. In fact, the temperature gradually rises during 60% of the oil run and is actually higher at the end than at the beginning of the oil run.

4. The time of contact of gas and oil in the carburetor is longer.

5. During the backrun, when oil is sprayed into the generator and passed down through the fuel bed, the oil is dissociated and carbon is deposited in the fuel bed, building it up and thereby reducing the quantity of solid fuel to be charged into the generator.

6. The result of reforming the oil gas which passes through the fire is a low gravity gas. This allows a longer blow purge period and the control of the gravity of the sendout gas.

In general the operating cycle of the ignition arch process consists of—

First: The Blow Period, during which the ignition arch functions as an ignition baffle, speeding up the thorough mixing and burning of the blast gases so that the desired heats are obtained in the carbureting zone in the shortest length of time. During the time of secondary air admission, air is also put through the scurfing slots in the bottom of the carburetor and the carbon formed during the preceding oil run is burned out.

Second: The Uprun Period, during which gas is made with steam passing up through the fire bed and oil is sprayed upward into the carburetor countercurrent to the blue gas coming from the generator.

Third: The Backrun Period, during which steam enters the top of the superheater and becomes highly superheated before passing down through the fire zone to make gas. At the same time oil is being sprayed into the generator, the oil gas passing down through the fire is dissociated, depositing carbon in the fuel bed.

A short uprun steam purge is made to complete the cycle before going on the next blow period.

A typical cycle is 5 minutes, broken up as follows:

Blasting	1′ 45″			Oil temp., 175° F. Cross over temp., 1400° F.
Up-run	1′ 27″	Oil period,	1′ 10″	
Back-run	1′ 24″	Oil period,	1′ 5″	
Up purge	9″			
Blow purge, (air)	15″			

Pounds steam per minute, up-run 120
Pounds steam per minute, back-run 160.
Steam pressure, 10 pounds.
Air per minute, 13,500 cu. ft.

General Advantages

In general, it has been found that the ignition arch carburetor can be very quickly brought back to gas making temperature after clinkering or other shutdown period. The clinkering of the generator is about the same with the ignition arch as before its installation. The ignition arch described in this article has been in operation for approximately 3,500 hours and is functioning efficiently.

Progress in Development Of Gas Plant Equipment

IN 1767, Henry Cavendish invented the water lute or water seal, one of the principles on which the gas holder is built. In 1781 Lavoisier invented a gas holder.

In 1805, Samuel Clegg built a gas works and lighted the cotton mill of Messrs. Phillips and Lee at Manchester. Nine hundred burners were supplied with gas.

In 1815 he invented the first consumer's gas meter and in the same year he obtained a patent on a rotary retort.

In 1816 he invented a wet meter with a revolving drum and in 1817 he perfected the first cylindrical gas holder.

Taylor and Mattmeau invented the oil gas process in 1820. In 1830, Clegg patented a dry meter. In 1835 gas meters were manufactured in New York. Many other improvements in meter construction followed, culminating in the wonderfully accurate instrument in common use today. In 1873-4 Lowe invented the water gas apparatus.

Within recent years important progress has been made in the technology of gas. The development of the vertical retort, the advent of low temperature carbonization and complete gasification, the use of bituminous coal in water gas manufacture, the introduction of the back-run, the use of oxygen in gas making, and various other technical improvements, are evidences of the great activity of gas technologists to improve the gas-making process.

The following pages contain brief descriptions of the progress made by manufacturers of gas plant and gas distribution equipment.

The Bartlett Hayward Company Provides an Interesting Bit of History of Over One Hundred Years

The Bartlett Hayward Company was founded in 1832 by Jonas H. Hayward, the firm at that time trading under the name of Hayward and Friend. The firm name underwent several changes; in 1837 to Hayward Brothers; in 1844 to Hayward and Bartlett; a little later to Robbins Bartlett; in 1880 to Bartlett Hayward and Company; and finally in 1909 incorporated under the name of The Bartlett Hayward Company.

Mr. Thomas J. Hayward, son of the founder, entered the business in 1880 and in 1906 appointed Mr. Howard Bruce, now Chairman of the Board, as General Manager.

The original business of Hayward & Friend was principally identified by the manufacture and servicing of stoves, and after the addition of a foundry became pioneers in the manufacture of the well known Latrobe Stove, "The Baltimore Heater," a dominant factor for a long time.

The early development of ventilation and heating facilities for larger buildings then contemplated and constructed soon resulted in the pioneering by the company of the present hot water heater.

The ability to produce high class castings soon found expression in the construction of the so-called iron building; "The Baltimore Sun" or "Sun Iron Building" being the first of several examples of this fore-runner of the present structural steel building. It is also interesting to observe that this same foundry pioneered the manufacture of machine-cast pipe.

A structural steel department was established soon after the steel mills were rolling shapes; and this department was before long responsible for fabricating and erecting a number of large structures for that time.

Passenger and freight elevators were demanded for the increasingly higher buildings, and their manufacture was vigorously pursued by the company for some time.

The history would be far from complete without the romance attending the building of the first Winans Locomotive during the Civil War, and too the building of "Light-houses" which for a time occupied a substantial part of the plant's activities.

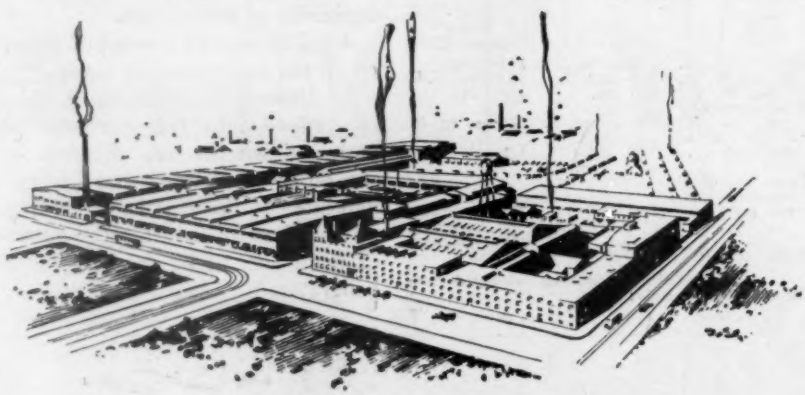
Original Plant—100 Years Ago

The early recognition of the value of an anti-friction bearing resulted in the substantial contribution to the early development and manufacture of "roller bearings"; a business finally disposed of to a well known manufacturer.

When the sugar industry was pioneered in this country, this company designed and built one of the first beet-sugar plants.

The records also disclose the fact that considerable interest and activity was evinced in the early development of an Adding Machine.

In 1876 the company entered the Gas Industry. Its contributions to



The Bartlett Hayward Co.'s Main Plant—Today

A RECORD• OF ACHIEVEMENTS IN THE GAS INDUSTRY

The Bartlett Hayward Company is eminently qualified to make a thorough, deliberate and intensive analysis of your requirements from a broad operating and economic viewpoint, and is ever alert to offer the Gas Industry continued advancement.

- Built the First Steel Tank Gas Holder.
- Built the First Ten Million Steel Tank Gas Holder.
- Built the Largest Multi-Lift Gas Holder in the World.
- Contributed to the development of and built By-Product Recovery Plants.
- Introduced the Waterless Gas Holder in this Country.
- Built the only Twenty Million Cubic Foot Holder in the World.
- Designed and Built the Largest Gas Manufacturing Plant in the Country and a considerable number of smaller plants and extensions.
- Developed and Designed a number of Special Process Plants and Plant apparatus.

THE BARTLETT HAYWARD CO.

—BALTIMORE —FOUNDED 1832— MARYLAND—

SUBSIDIARY COMPANY: THE WESTERN GAS CONSTRUCTION CO., FT. WAYNE, IND.

Coal Gas, Carburetted Water Gas, Blue Water Gas, By-Product Plants—De Brouwer Charging and Discharging Machines Waste Heat Boilers—Purifiers—Tar Extractors—Condensers—Feld Scrubbers—Fast's Couplings—Tanks—Gas Holders

the development of that industry can best be observed in the fact that it has designed, fabricated and erected over 950,000,000 cubic feet of gas holder storage capacity, varying in sizes up to 20,000,000 cu. ft.

This represents approximately 68% of the 1,400,000,000 (approximate—according to U. S. Dept. Commerce) of gas holder capacity now in service in this country. It includes over 304,000,000 cu. ft. of waterless holder capacity, which alone represents about 22% of the entire country's storage capacity.

It has also contributed in a great measure to the development and building of By-Product Plants; it has designed and built a number of special process plants and plant apparatus in various sections of the country.

Such an inspiring record of achievements, covering a space of one hundred years, should be but a threshold of a second century of engineering services and responsibilities to American Industry and to the American Gas Industry in particular.

Cruse-Kemper Holders

Though the builder of gas holders and other major equipment units can rarely startle the Gas Industry with revolutionizing inventions for the storage and processing of gas, he constantly has opportunity for developing modifications in his technique and in the details of design and erection—modifications which result in improvements in the structures themselves and in their service.

Efforts to build new units that will cost less to erect and to operate, are explained with the thought that there must be other organizations, within the industry, constantly working to the same end. The Cruse-Kemper Company in fact, sees the necessity for this effort as being of such fundamental value both to the purchaser and to the builder that, for any builder who aims to progress in the industry, the effort must be the primary occupation of his engineering and research staffs.

The Company's policy is not to find ways of building holders of the lowest initial cost. It is to discover, through study, the means of building that holder which best fits the purchaser's needs, which at the same time costs the minimum for its quality.

Let us take a small angle-bracket used to support the deck. It looks like a good bracket, strong enough, angled correctly; once put in place it will do its work. The engineer looks at it, asks himself whether it is as good as it could be. What about its making a small crevice when bolted or riveted in place? What about this depression in the upper surface; won't that form a pocket and collect water, tend to give corrosion a good start? Right there begins the redesigning of that bracket for water-shedding and tight fitting. Right there starts a saving in the yearly charges for keeping the structure, on which it is placed, in good condition.

Scores of similar examples might be given in which there is a direct relationship between the research carried on by the holder-builder and the purchaser's gain of lowest holder-cost per year of use. Each one would tend to substantiate the rightness of the efforts to find better ways of performing each step of design.

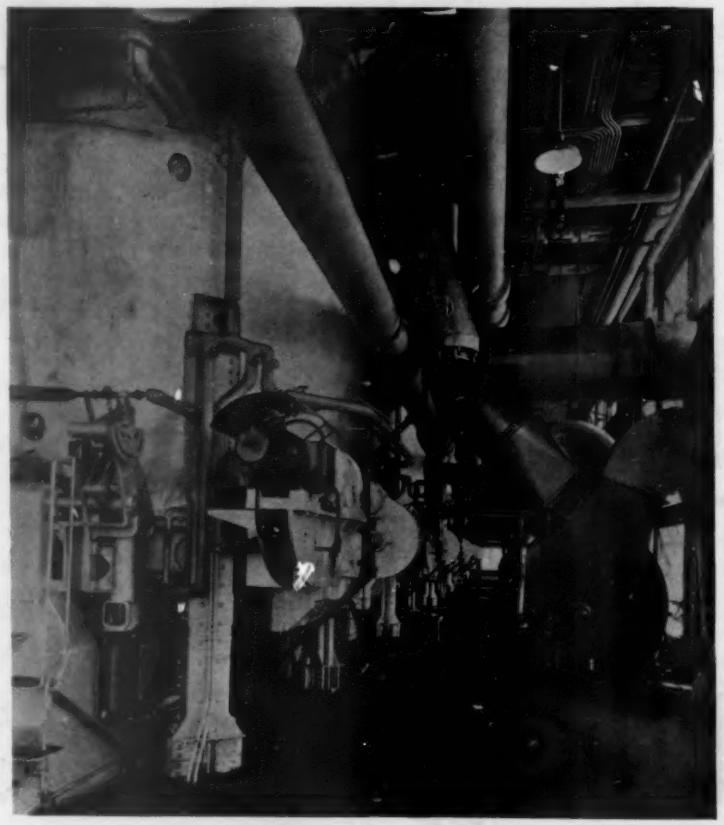
U. G. I. Equipment

Gas Plant Equipment Manufacturers have spent thousands of dollars in research work and in the development of gas making machinery. The last half century of progress in the production of carburetted water gas shows the record of U. G. I. research and development. The double superheater carburetted water gas apparatus, air and steam control, hydraulic operation, use of steam accumulator, automatic control, mechanical generator, waste heat boiler, high duty condenser, refinery-gas and natural-gas reforming process, and heavy oil process are the more outstanding U. G. I. developments.

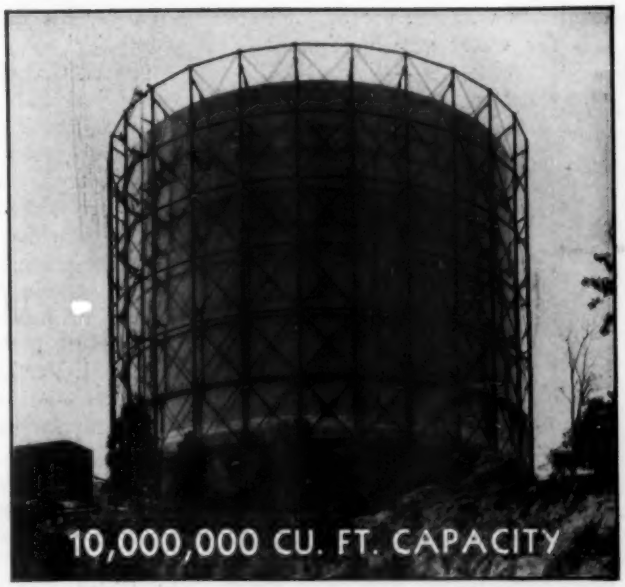
The U. G. I. Mechanical Generator is in use in many gas and industrial plants. The U. G. I. Mechanical Generator, U. G. I. Charger with automatic fuel handling, and U. G. I. automatic control give complete automatic production of carburetted or blue water gas.

The generator shell embodies an annular water jacket, which forms a low pressure steam boiler surrounding the lower portion of the fuel bed, and prevents adhesion of the clinker to the generator walls. A rotating grate, of the Haug stepped type, and an ash pan provided with cutters, break any clinkers formed and discharge them with the ashes into external ash hoppers. Uniform fire activity is secured by admission of air and steam to the center of the fuel bed through the Haug grate.

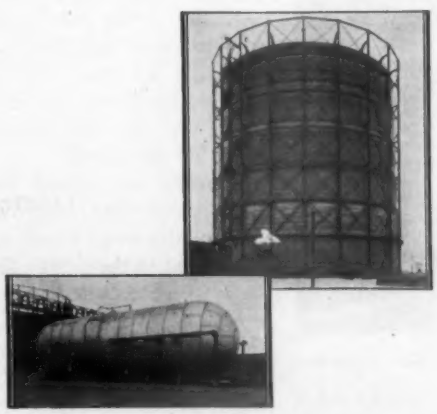
Many years' experience of U. G. I.



U. G. I. Mechanical Generator



Built up to the best of standards . . . kept down to a predetermined price



Manufacturers of GAS HOLDERS and other major equipment units for the GAS INDUSTRY

The 10,000,000 Cu. Ft. Holder, pictured above, is an example of Cruse-Kemper's achievement in building to the highest possible standard of quality while keeping purchaser's costs gratifyingly low.

Years of specialization, years of gathering engineering skill in working almost exclusively with the problems of the Gas Industry, have prepared us for such achievements in reconciling quality and price.

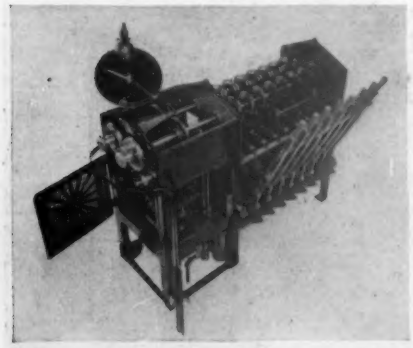
We find today a still less costly method of getting a big plate in position. We are constantly finding little ways of saving time and money, of so performing each step of desiga, fabrication and erection that the best of results are gained.

Finished jobs by Cruse-Kemper have a way of being gas-tight. Records for low cost of operation and maintenance show on purchasers' books.

CRUSE-KEMPER CO.

AMBLER, PA.

engineers with the use of high coke oils for water gas enrichment—the



U. G. I. Automatic Control Machine

research work dating back to 1920—resulted in the U. G. I. Heavy Oil Process upon which four patents have been issued and over seventeen patent applications made. Heavy oils having a coke content of as high as 14% have been successfully used with this process.

This process has been installed on over 100 carburetted water gas sets having a rated daily capacity of over 300,000,000 cubic feet, and is giving high efficiencies.

One of the most interesting of recent developments is the U. G. I. Reforming Process. This process, which is carried on upon a water gas set, utilizes refinery gas having a specific gravity of 1.0 and a heating value of 1200 to 2000 B.t.u. per cu. ft., to make a gas of as low as .55 gravity and 530 B.t.u. heating value. This gas is suitable for distribution in place of carburetted water gas, coal gas or as a mixture with either.

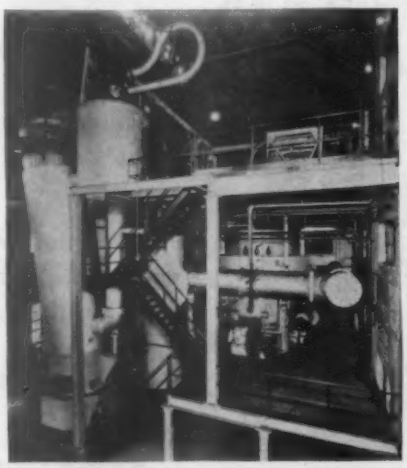
This process can be used to reform natural gas so as to improve pipe line load factor by varying the amount of finished gas made, with a fixed amount of natural gas used, and for situations where it is economical to utilize natural gas as a fuel within the set in place of other gas making fuels.

A high hydrogen gas from oil refinery gas or natural gas can be made with this process for use in Chemical plants.

The U. G. I. Pressure Producer is a self-feeding and self-cleaning apparatus which operates continuously with only general supervision. The producer is especially designed to handle the small sizes of coke which otherwise have but a low price market. The producer gas made has a heating value of approximately 130 B.t.u. per cu. ft. and is generally used for the heating of carbonizing plants.

The U. G. I. Pressure Producer is water jacketed to eliminate clinker troubles, and is equipped with a motor driven rotating grate of the Haug stepped type. The rotation of the grate carries the ashes against a fixed ash plow which removes the ashes from the grate and discharges them into an outside ash hopper, thus permitting of continuous operation of the producer.

U. G. I. Vertical Chamber Oven is the latest advance in carbonizing equipment for gas company use, being practically identical with the Stettiner Oven, so successful abroad. The oven setting is fundamentally adapted to steaming, which gives marked increase in gas yield and reduced coke output per ton of coal; operates with low labor costs, and



U. G. I. Carburetted Water Gas Apparatus

produces a high grade, readily marketable, coke from a single gas coal.

The Oven is recuperative, and can be heated by either producer or oven gas.

The U. G. I. Automatic Control Machine, fundamentally developed for the operation of water gas machines, is also adaptable to any industrial process involving cycle operation of hydraulic valves. It is built as a 6, 7 or 8 valve machine as standard and can be built for a greater number of operations to take care of special uses. It is operated by an electric motor protected with safety features. Levers are provided for manual operation in case of power failure, so that the machine can be instantly changed from automatic to hand operation.

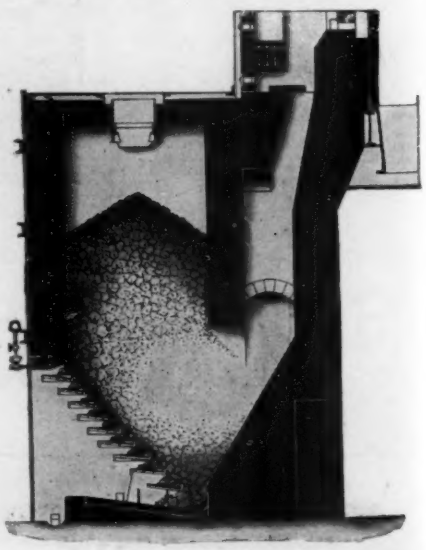
Glover-West System

West Gas Improvement Co., Inc., 441 Lexington Ave., New York, was founded in 1873 by John West, in England, who since 1870 had been engaged in the development and construction of coal distillation systems but who was well known for his work on the application of power and machinery to stoking retorts. His work in this field stands for progress—progress from the day of laborious retort house operation to that of the substitution of machinery for arduous hand labor.

Following up the researches of William Young on the distillation of shale for oil production in vertical retorts he applied and perfected this principle in the development of the continuous carbonization of coal in vertical retorts for gas production, under the system which is now known the world over as the "Glover-West System."

The first commercial installation of Glover-West Vertical Retorts was put into operation in 1908 followed by another in 1910 by which time the process had attracted considerable attention in the gas industry. In 1911 a plant was built for the Fitchburg Gas & Electric Light Company, Fitchburg, Mass. At the present time there are over 350 installations in all parts of the world.

During the period from 1908 to the present time, improvements were continually being made and new ideas embodied in the design to take advantage of recent developments and to meet the ever-changing problems of the gas industry. Improvements have been made to give finer control and adjustment of the carbonizing heats and to increase the thermal efficiency



Step-Grate bench producer

...an unbroken dividend record
for forty-eight years.

THE UNITED GAS IMPROVEMENT COMPANY

of the bench. Waste heat boilers for the generation of steam from the surplus heat in the stack gases and breeze burning producers have now become standard equipment.

The development of the process of "steaming" is a noteworthy advance in the process of continuous carbonization. In the Glover-West System water gas can be made continuously in the bottom portion of the retort at the same time that coal gas is being evolved in the upper portion of the same retort.

S. J. Beale is General Manager and S. F. Knight, Assistant Manager.

Toggle Type Flanged Street Regulator

This type regulator recently developed by Reynolds Gas Regulator Company, is made in both dead weight and spring adjustment for outlet pressure.

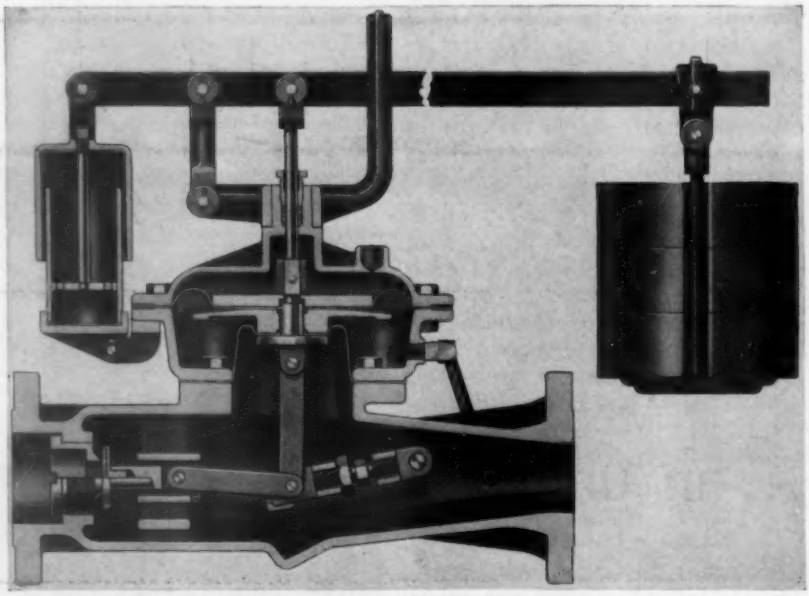
It is made with 2" x 2" connections, or 3" x 3" connections.

Special feature of this regulator is that the control leading under the main diaphragm is carried directly to the outlet throat, or can be disconnected and carried to a distant point.

The diaphragm cases may be changed so that either pounds-to-pounds or pounds-to-inches regulation may be secured. This feature is particularly desirable, as if conditions change, the diaphragm case may be changed to meet these conditions.

It has removable orifice and removable valve pocket. Furnished complete with companion flanges.

The Reynolds Gas Regulator Co., Anderson, Ind., has been serving the gas industry for many years, helping to solve the problems of the flow of gas under all conditions, and varied pressure combinations.



Toggle Type Flanged Street Regulator

Chaplin-Fulton Regulators

Forty-nine years ago The Chaplin-Fulton Mfg. Co. was organized to engage in the manufacture and sale of pressure-reducing regulators for natural gas.

Mr. Louis B. Fulton, one of the original founders of the company, was Chief Engineer.

The Chaplin-Fulton Mfg. Co. pioneered the development and manufacture of pressure-reducing regulators for natural gas in this country and "Fulton" Regulators are now used wherever there is a market for natural gas.

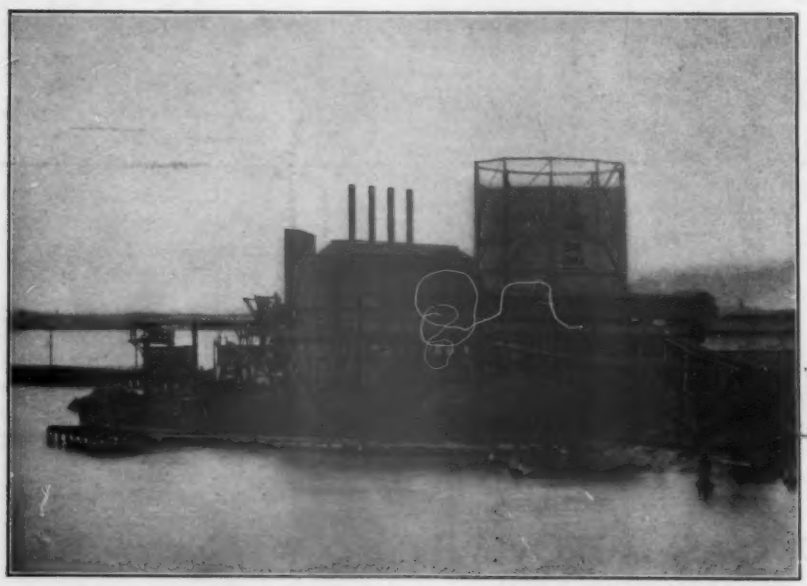
In the early days of natural gas there was need for only a few types of regulators and the regulator of that period admirably met the requirements. But with the advent of manufactured gas there was born an industry which has advanced rapidly, until today the distribution of natural and manufactured gas for domestic and industrial consumption has become a tremendous and important industry.

Although the principle of the regulator of today is no different from that of forty years ago, the constantly increasing demand for more sensitive regulation has necessitated new types of regulators and major improvements over the original types.

"Fulton" Regulators have kept pace with the demand for better control. There are at present some fifty different types of "Fulton" regulators being shipped all over the world for all pressures and services.

Today we can not predict what may be required of regulators of the future. But with every advancement in regulation to date, a "Fulton" regulator has been developed to meet the requirements.

The "Duplex Sensitive Gas Governor" has long been known to the industry for its accuracy in low-pressure regulation. This same principle has recently been applied to regulators for higher pressures with pronounced success.



Glover-West Installation at Portland, Me.

OTHER GLOVER-WEST INSTALLATIONS

Fitchburg, Mass.
Springfield, Mass.
Portland, Maine
Stamford, Conn.
Pawtucket, R. I.
Ottawa, Ont.
Vancouver, B. C.
Victoria, B. C.
Watertown, N. Y.
Malden, Mass.
Fargo, N. D.
Toronto, Ont.
Guelph, Ont.
Santos, S. America
Pernambuco, S. Amer.
Buenos Aires, S. Amer.
Fall River, Mass.
Faribault, Minn.
Halifax, N. S.
Belleville, Ont.
Rio de Janeiro, S. America

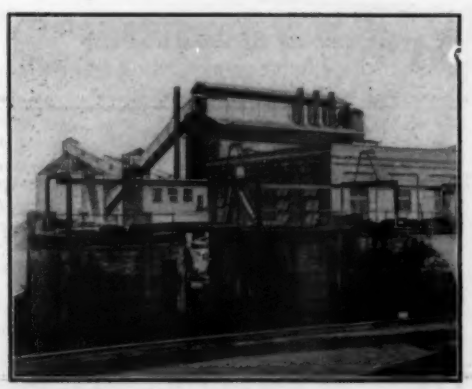
An International Company Greets the Delegates to the International Gas Conference

You who are vitally concerned with "Gas the World Over" should find the Summer Number of *"West's Gas"* (house organ of West Gas Improvement Co.) particularly enjoyable.

The issue is a survey of the Gas Industry throughout the world—its present position in the principal countries of the civilized world, its organization from the technical and economical points of view, and its hopes for the future.

The writers are in every case authorities upon the gas affairs of the countries which they represent. There is an abundance of aerial photography showing plants and equipment.

"West's Gas" is yours on request without charge or obligation. To whom should your copy be addressed?



In Glover-West Vertical Retorts there is no complicated machinery, no naphthalene troubles, and coke requires no quenching. Over 350 installations in all parts of the world.

WEST GAS IMPROVEMENT CO.

BUILDERS OF COAL GAS PLANTS — 441 LEXINGTON AVE., NEW YORK, N. Y.

LONDON
Regent House
Kingsway, W.C.2

PARIS
Cie.Gle.de Construction de Fours
8, Place des Etats-Unis
Montrouge (Seine)

SYDNEY
Union House, 243, George Street, Sydney, N.S.W.

One of the most recently developed "Fulton" regulators is one which maintains a constant pressure ratio between two cources of supply. It is used principally in industrial furnace work for the control of the gas and air supply to the burners and is called the "Duplex Gas-Air Proportioning Regulator."

Refractory Screen Oil Gas Process Development

Several years ago the Combustion Utilities Corp. made an extensive economic survey of the problems of high B.t.u. peak load and emergency standby gas production, the result of which led to research work in their laboratory as the solution clearly indicated that high capacity, fuel storage and gas utilization qualities could best be supplied by oil gas. Previous experiments and theoretical study had shown sufficient carbon is available from the cracking of most oils to provide the heating requirements of cracking a subsequent and equal quantity of oil. Obviously the simplest method of retaining the carbon and of providing large surfaces of contact in a small space for the cracking of the oil was the use of the so-called "Refractory Screen" which substitutes for the fuel bed of a water gas generator and is composed of small special refractory blocks dumped at random on a refractory grate in the generator.

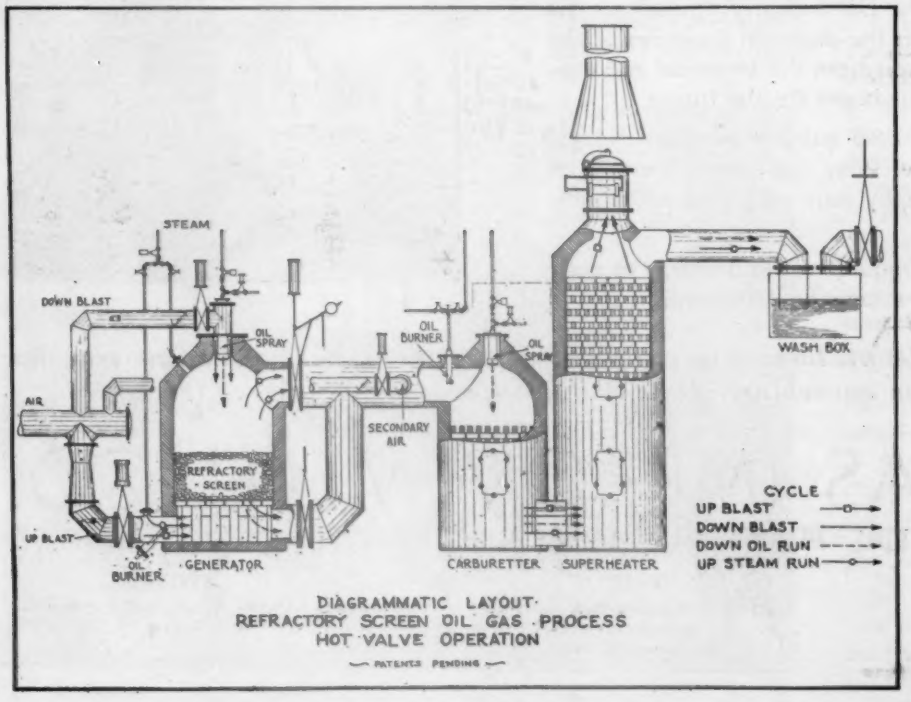
A great amount of data was collected on the efficiency of carbon retention and pressure drop through various sized and shaped screens and how to burn it. Finally thorough tests first on a fully automatic 5' 0" O.D. set and then on a 9' 0" O.D. hand operated machine were made. The data and results thus secured consistently confirmed laboratory findings.

Since that time marked progress has been made in the simplification and lessening of conversion cost for the changes necessary for oil gas operation.

The accompanying cut illustrates in diagrammatic form the conversion changes and operation of a "hot valve" water gas machine. Oil is substituted for solid fuel in the generator and a downblast air connection and the installation of refractory screen are shown.

Operating tests were recently run on two 11' 0" O.D. sets converted to the Refractory Screen Oil Gas Process for the Public Service Company of Colorado at Denver. Both sets are for standby service and are semi-automatically controlled. Straight 1100 B.t.u. oil gas was produced and served to 14,000 customers with but a small number of complaints. A short description of these tests appeared in the August issue of this journal. The operations satisfactorily established the use of the gas and the process for emergency service requirements.

For the past year and a half this process has been available to the gas industry. It was developed as a practical method of supplying peak and standby gas for artificial gas properties now converted to natural gas. The production of a high B.t.u oil gas substitute for natural gas can be obtained from former three shell carburetted water gas sets, the conversion of which for this type of operation is readily accomplished with slight modifications. A wide range of gases can be made at high capacity while gravity and flame characteristics are such as to meet practically all system requirements.



DIAGRAMMATIC LAYOUT
REFRACTORY SCREEN OIL GAS PROCESS
HOT VALVE OPERATION

— PATENTS PENDING —

American Meters

The American Meter Company, Inc., 105 West 40th Street, New York, N. Y., was established in 1836. Foremost in any summary of this ninety-seven year old company's history must be stressed especially significant policies which have played so large a part in its industrial progress in the industry.

At a time when gas measurement was based largely on practical experience rather than on authentic scientific knowledge, American Meter Company factories adopted a policy of close cooperation with customer requirements and this policy has not only been maintained but has been intensified and expanded. It has been reinforced by the continuous research activity of recent years both cooperatively with gas companies and independently in the company laboratories at Albany and Erie.

Out of these activities have grown practically all of the significant developments in meter design and construction.

Another part of its service to the gas industry has been to develop and make available, measurement and control equipment for as many types, sizes and capacities as are needed to meet conditions of installation and operation.

In American Meters the valve seats are cast into the valve table by a special machine which has been developed by the company. Advantages claimed for this new method are: Correct relation between the crank bearing and the valve seats. Due to the uniform method of casting, possible leakage

STANDBY PROTECTION

Assured for Natural Gas Loads with Refractory Screen Oil Gas Process

This process protects your send out in event of line failure.

New installations made or, present carburetted water gas plants readily converted.

By converting present water gas sets, plant investment need no longer be questioned in properties now serving natural gas.

GAS ON QUICK NOTICE AT HIGH CAPACITY

Generating units quickly started from cold can meet all **emergency demands** and **peak load** requirements.

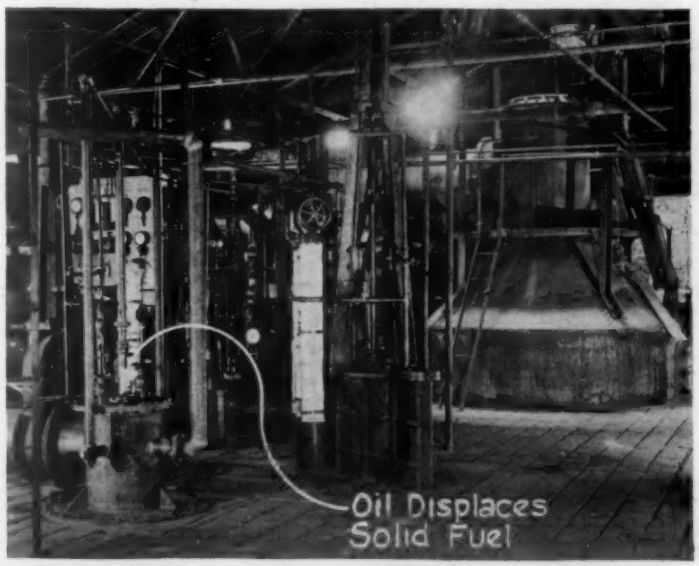
Present manufactured gas plant volumetric capacity maintained in the production of a satisfactory natural gas substitute.

NO SOLID FUEL

This process eliminates solid fuel and there is no expense for clinkering or handling.

The process produces high B.t.u., low gravity gases with flame characteristics which provide practical substitution for natural gas.

The combined engineering facilities and services of the Combustion Utilities Corporation and ourselves are available for the engineering, design and installation of converted or new equipment for this process under guaranteed results.



RECENT INSTALLATION AT DENVER MEETS STANDBY REQUIREMENTS

For standby protection against failure of their natural gas supply, the Public Service Co. of Colorado converted two 11'0" water gas sets at Denver to the Refractory Screen Oil Gas Process.

For standby test purposes, operations extended over a five day period. The gas made was sent out, unmixed, over an isolated section of Denver.

Results of the operation, and utilization performance of the gas in the customers appliances established the practicability of the process for standby requirements.

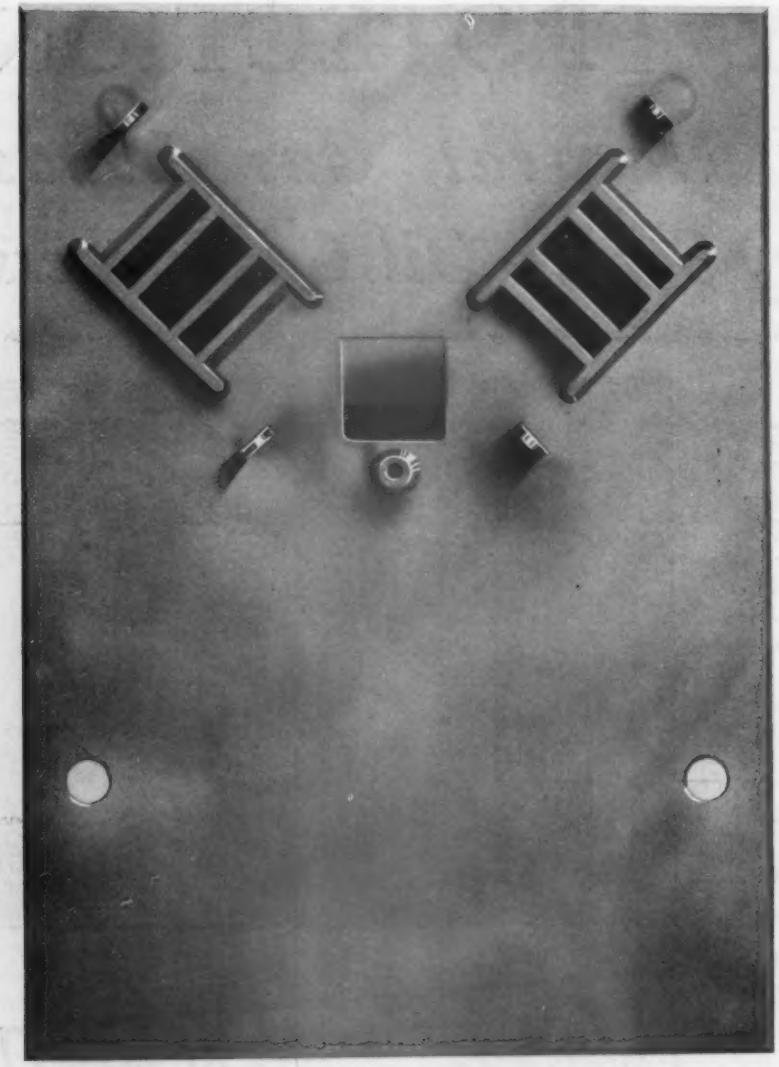
Complete information as to results obtained in these tests are available to interested gas companies.

THE REFRACTORY SCREEN OIL GAS PROCESS

Write for complete information

Improved Equipment-Russell Engineering Corp.

24 State Street **New York, N. Y.**



Valve Table, Complete, for 5-B-150 American Meter Showing Cast-in Valve Seats. Inlet Channel is Under the Valve Table

is eliminated at the points where the white metal seat is joined to the valve table. Uniform port area is insured—irrespective of subsequent wear or regrinding—because the seats are so cast that the grids, adjacent to the top of the seats at the points of cut-off, are at right angles for a distance of approximately 1/32 inch.

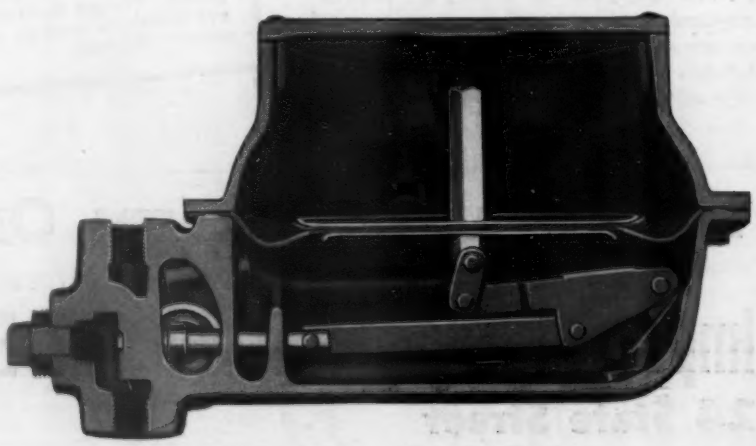
Base pressure and volume indexes are of particular interest in solving the problems in high pressure displacement measurements. They provide high pressure readings automatically and instantly. The American Base Pressure Index automatically multiplies the quantity of gas passing through the meter, at pipe line conditions, by the factor of the line pressure divided by the base pressure and registers the resultant on a straight reading index.

The Base Volume Index multiplies the volume passing through the meter by the pressure factor, and subsequently by the temperature factor, so that the volume indicated by the

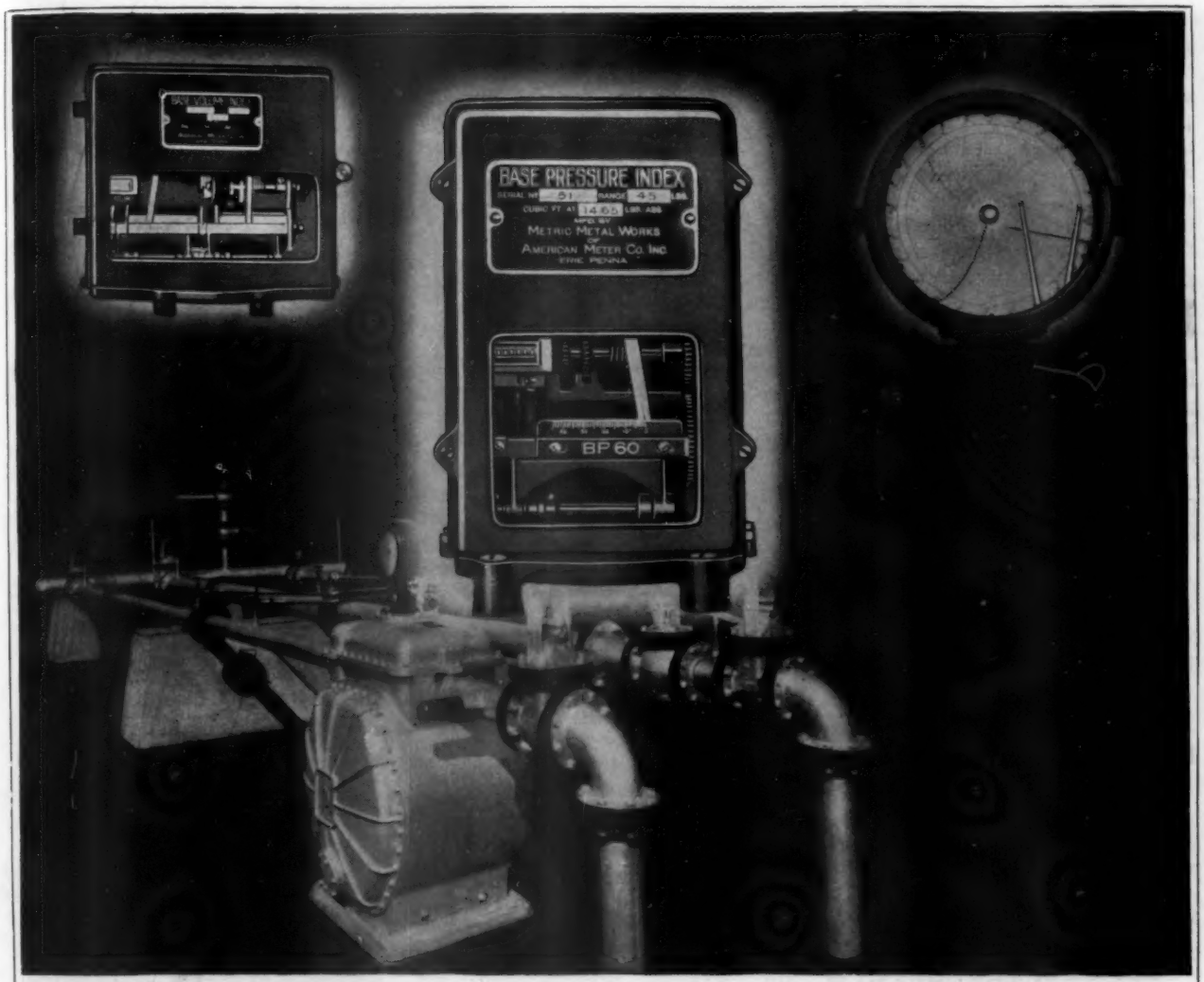
Showing Volume and Pressure Gage used with Base Pressure Index.

counter index is the volume in standard units. Any volume and pressure gauge can be readily installed on the top of the base pressure index or base volume index. The chart serves as a permanent record of the rate of flow and pressure, and can also be used as a check reading when desired. The same index is used for all meters, the only variation being in the base plate.

Another product of the company is their Reliance Type "H" Service Regulators. The diaphragm operates uninterruptedly from expansion pressures, and the equalizing pressure is taken for diaphragm operation after the gas has been fully streamlined.



Sectional View of Reliance Type "4" Regulator



INDUSTRIAL CONTRACT BILLING DATA • INSTANTLY!

Contract billing no longer is dependent upon the calculating of charts. Your billing data is automatically totalized on the index.

THE BASE PRESSURE INDEX continuously registers a totalized reading of the quantity of gas which has passed through the displacement meter (at the base pressure). Each hundred cubic feet (at line pressure) is multiplied by the pressure factor which applies for the line pressure and the pressure base.

THE BASE VOLUME INDEX registers the quantity at standard conditions of base temperature as well as base pressure.

Both instruments have proved their value on a great many installations. Engineering bulletins giving details of operation and application will be mailed you on request.

129

AMERICAN METER COMPANY
INCORPORATED
Measurement and control of Gas, Oil, Steam, Air and Liquids
ESTABLISHED 1836

METRIC METAL WORKS *ERIE, PENNSYLVANIA*

Albany Baltimore Birmingham Boston Chicago Denver Erie Kansas City
Los Angeles Philadelphia Pittsburgh New York San Francisco
WESTCOTT & GREIS, INC., Dallas, Tulsa CANADIAN METER CO. LTD., Hamilton, Ontario

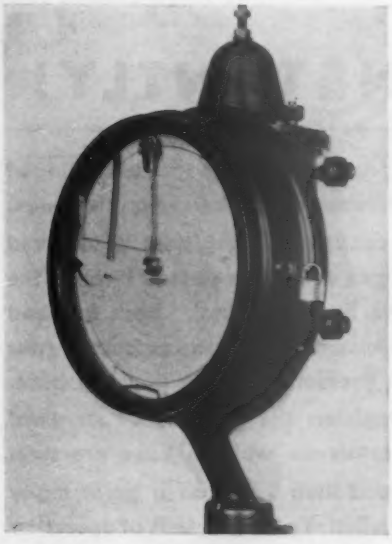
AMERICAN METER CO.

The toggle action allows a longer and more powerful thrust to be exerted on the valve seat, and results in lower lock-up pressures. A convenient pipe plug permits the attachment of a gauge for taking service pressures, and for blowing the service lines free of dirt, scale, etc. Where the side inlet is used for service connection, the bottom connection can be plugged to serve as an accumulation reservoir for dirt, etc. Type "H" is available in both weight loaded and spring loaded models. The complete Reliance line includes Appliance Regulators, Service Regulators, High Pressure Regulators, Bottled Gas Regulators, Back Pressure Regulators, Pilot Type Regulators, Safety Relief Valves and Regulator Testing Devices.

The factory trade names of the American Meter Company are: American, Griffin, Maryland, H. & M., McDonald, Metric, Pacific, Tufts.

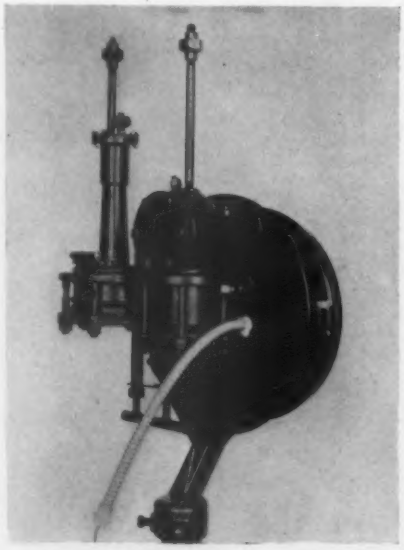
Foxboro Measuring and Recording Devices

Gas meter manufacturers have also developed many new and improved measuring and recording devices. Foxboro Company, Foxboro, Mass., during the last year has added several new Gas Meters to its standard line. All of these meters are of the Inferential Type and employ orifice plates, flow nozzles, venturi tubes and pitot tubes as primary devices in the line.



The Foxboro Bell Typemeter

The first of these instruments, the Foxboro Bell Type Meter, was designed to fill the need for an Inferential Type Meter for the measurement of gas at low pressures. It is particularly useful on manufactured gas distribution lines. This instrument contains the Foxboro straight-line motion. Bell Type Meters will give accurate readings of the flow in low pressure manufactured gas lines, fan type blower discharge lines, and compressor discharge (low pressure).



Rear View of Uniform Flow Scale Integrating Meter

In the new Foxboro Uniform Flow Scale Integrating Meter, a positive zero is obtained without the use of zero stops. This instrument has a uniquely constructed low pressure chamber that makes the uniform scale possible, and a large powerful float that insures uniform power throughout the scale. It has a wide flow rangeability and integrates accurately over the complete 10-1 flow ratio. Combinations of temperature and flow, pressure and flow, or temperature, pressure and flow may be had on the charts for this meter.

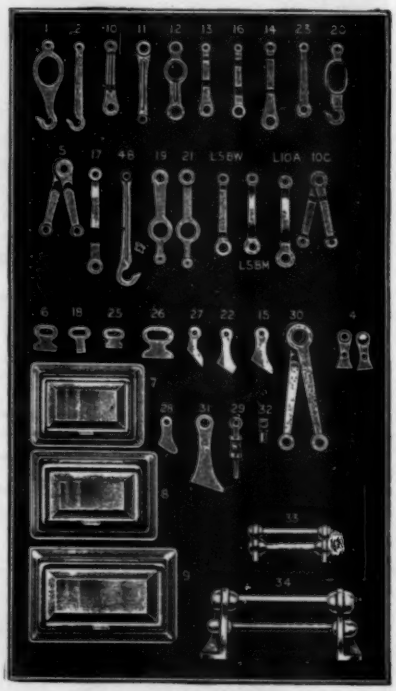
The Foxboro Pressure Compensator can be furnished for use with most of the standard range Foxboro Meters. This feature makes it possible to record and integrate gas accurately at variable pressures. This device is extremely simple and has no complicated mechanisms to service. It compensates the flow records as well as the integrations without lost motion or friction.

All of the meters are easy to clean and easy to check since all parts are readily accessible. Patented check floats protect from overrange.

Lambert Meters

The Lambert Meter Co., Brooklyn, N. Y., manufactures gas meters in all sizes, gas diaphragms, and gas meter repairing, also the building of a full line of gas apparatus.

During the latter several years the company has branched out into a field of service, namely the manufacture of meter repair parts for all makes and sizes of meters regardless of age. These parts include tinplate stampings, brass fittings, indexes, valve arms of all sizes and descriptions, cranks to dimensions for all meters, flag arms, and, in fact, every-



Meter Repair Parts

thing that a meter repair shop may require in its repair work regardless of how obsolete the parts needed are.

The Lambert Meter Company represents approximately 40 years of experience in the gas meter manufacturing business. The company as such was started 13 years ago with David N. Lambert as its president and manager and N. D. Lambert, Jr.,

They All Have The Same Characteristics!

The Foxboro Bell Type Meter for Low Pressure Gas Measurement.

◆ Your flow conditions may require a Pressure Compensated Meter, a Uniform Flow Scale Integrating Meter, or a Low Pressure Bell Type Meter. You can select any of these Foxboro Meters with the assurance that they all have the characteristics so essential to continuously accurate measurement.

Under all conditions Foxboro meters are:—

- **Accurate**
- **Economical**
- **Dependable**
- **Permanent in Calibration**

◆ PRESSURE COMPENSATED METER. The Foxboro Pressure Compensator makes it possible to record and integrate gas flow accurately at variable pressures. The chart records are compensated as well as the integrations. There are no complicated mechanisms in the Foxboro Pressure Compensator. It operates effectively and efficienetly—without friction and lost motion.

◆ UNIFORM FLOW SCALE INTEGRATING METER. This unusual Meter has a wide flow rangeability of 10 to 1. The specially designed integrator in this instrument gives accurate integration over the entire 10 to 1 ratio. One of the important advantages of the even scale chart is that temperature and pressure records can be made on the same chart with the flow record.

◆ BELL TYPE METER. This instrument is ideal for low pressure gas measurement. It may be used with any of the primary devices—orifice plate, flow nozzle, venturi tube, or pitot tube. The flow capacity of this meter can be changed easily by changing the size of the primary device.

Write for complete information on any of the above meters!

FOXBORO
THE COMPASS OF INDUSTRY

THE FOXBORO COMPANY, FOXBORO, MASS., U.S.A.

BRANCH OFFICES IN ALL PRINCIPAL CITIES

••COMPLETE INSTRUMENTATION FOR GAS DISTRIBUTION••

as chief engineer. Mr. D. N. Lambert has been manufacturing meters and allied apparatus for 40 years, some twenty odd years with the American Meter Company and five years with another meter company and since then with the Lambert Meter Company. N. D. Lambert, Jr., joined the company at its formation and previously graduated from Columbia and University of Pittsburgh (Mellon Inst.) in gas engineering, subsequently doing research work for the Bureau of Mines and U. S. Navy (during the war) and later with the old N. Y. Mutual Gas Light Company.

Superior Meters

The Superior Meter Co., Brooklyn, N. Y., makes gas meters, diaphragm leather and service pumps, provers and wet test meters.

The Superior Service Cleaner with a three-way valve is a recent development of the company. The solid copper construction is described as a very sturdy pump. It has a capacity of 3½ gallons of alcohol.

Superior Service Pump

For handling the large capacities necessitated by house heating loads and industrial loads, they have developed a full line of expansion diaphragm meters. The new improved ring with rolled edge and inside solder joint, together with special valve design and construction, eliminates noisy conditions.

Sprague Meters

The Sprague Meter Co., Bridgeport, Conn., has been a factor in the "Century of Progress" of growth, development, improvement and the attainment of the highest in the art of the gas industry. In the last thirty years of the century the Sprague Meter Company has contributed its share towards the development and manufacture of gas meters and regulators. Through the efforts of Mr. H. H. Sprague, its inventor, and Mr. William P. Hutchinson, its present president, this company has grown to be one of the largest manufacturers of cast iron gas meters and regulators. They have kept step with the progress of the industry and even anticipated (when they pioneered in the manufacture of cast iron meters) the trend of high pressure installations. Many improvements have been made in their products to assure longer life, better service and extreme accuracy so essential in this day and age of efficiency. When the rapidly growing industry of liquefied petroleum gas came into existence the Sprague Meter Company was one of the first to develop a meter and regulator to handle and measure accurately these butane-propane mixtures. When the gas industry called for a large-capacity positive displacement meter this company again met the demand by bringing out a 30,000-cubic foot meter equipped with 6" standard flanges.

R-C-W Purging Machine

The Roots-Connerville-Wilbraham Company, which is a combination of the P. H. & F. M. Roots Company, the Connersville Blower Company, Inc., and the Wilbraham-Breen Blower Company, have been serving the gas industry for over a century with a variety of products. These products consist of Connersville Meters, all types and sizes, R-C-W gas pumps, exhausters and boosters, all of the Rotary Positive type, as well as a complete line of Cycloidal Pumps and Turbine Pumps.

One of their latest developments is the R-C-W Harrison Purging Machine. The inert gas producing apparatus is mounted on a Ford truck and is driven by a power take-off from the truck engine.

This machine was brought out about a year ago and has since had several refinements in design such as placing the cooling chamber in a horizontal position instead of vertical, making it a more compact unit. The machine is built in several sizes ranging from 12,000 to 40,000 cubic feet of inerts per hour and suitable for oil-fired burners as well as manufactured or natural gas burners.

R-C-W. Harrison Purging Machine

SUPERIOR

Gas Meters

Wet Test Meters
Demonstration Meters
Service Cleaners
Provers
Diaphragms
Semi-Chrome Bark-Tanned
Repairs

SUPERIOR METER COMPANY
BROOKLYN
New York

A Brief Outline of the History of Rubber as Used in Gas Pipe Lines

The use of rubber as a joining material in pipe lines dates back to about the latter half of the 19th century. The first line to use rubber gaskets was laid in England in 1863. That rubber had been used in joining this early line escaped the notice of Distribution Engineers in England until in 1903 when Mr. Walter Hole laid a line of one hundred and fifty yards at Torquay. This line was an experimental one.

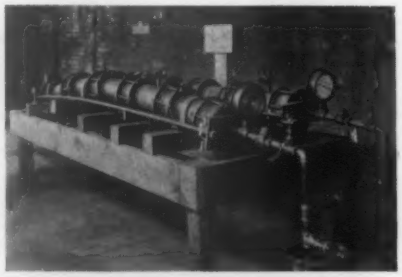
Due to the settling and shifting of the earth in this region, the cost of maintenance was so great than any experiment was worth trying. This experiment was a success, and led to further investigation into the use of rubber gaskets.

Gaskets in test in 16" and 20" bell clamps

The history of the use of rubber pipe gaskets in France dates back to 1870 when a line was laid in the City of Nice, and later in 1878 rubber was used in the City of Lyons. These were low pressure gas lines. The success of these lines may be judged by a statement made a few years ago by the director of the gas company at Lyons in which he said, "With the exception of some sections where road changes, etc., have required alterations, this line has not been disturbed since it was laid in 1878."

While rubber has been used as a joining material in pipe lines in the U. S. since the earlier part of the 19th century, Paranite, the rubber gasket developed by The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J., was commercially manufactured for couplings and clamps for the first time in 1912.

In the natural gas industry Paranite Gaskets have performed most satisfactorily for over a score of years. For the more severe service in the manufactured gas industry—due to the solvent effect of the distillates in the gas—Paranite Gaskets



Gaskets in test with couplings

meet all requirements. They have been developed to their present efficiency through constant research guided by the past experience and constructive criticism of the personnel of the distributing gas companies, the Pipe Joint and Coupling Manufacturers, and the Pipe Joint Committee of the A. G. A.

An important part of this research work is the series of physical and performance tests made to determine the characteristics of the gaskets and their suitability for the service required of them. Consideration is given such important points as resistance to drip oil, low cold flow or permanent set, non-blooming and good ageing. Tensile and elongation tests are made on the rubber stocks, for although high tensile strength is not the paramount factor it contributes to the quality of a gasket. Tests are made both before and after accelerated ageing. Ageing tests are made both in the Bierer-Davis Oxygen Bomb and the Gear Ageing Oven.

Cold flow tests for permanent set under compression are made according to the so-called "Chrysler Cold Flow Test." Gaskets are also tested for their ability to pack or seal in joints, couplings or clamps. The accompanying illustrations show some of the methods of testing.

Stoppers Since 1897

The Goodman Gas Main Stopper has been on the market for 36 years with improvements from time to time. The patented Locking Sleeve and "Z" Handle are the latest improvements and assure the user of a safe, quick shut-off during alterations and repairs.

These stoppers are manufactured by the Safe Stopper Company of Brooklyn, New York

The Goodman-Pedan Gas Main Stopper is the latest gas main stopper. It was designed by Mr. Hugh L. Peden, superintendent of mains of the Consolidated Gas Company of New York. The flexible frame, padding, covering and diaphragm of the Goodman Stopper remain in principle in this stopper but the handles have been discarded and a new arrangement in construction makes it possible to operate it mechanically.

Dependable Gas Main Bags are made in four types, Type "A" light weight plain rubber, Type "B" medium weight, Type "D" heavy weight and Type "C" canvas-covered.

The Canvas-Covered Gas Main Bags are for use in mains coated with tar or oil or wherever a plain rubber bag will not hold. This bag consists of an inner bag of fine quality rubber, strong and expansible, encased in a cover made of best quality duck. These bags are equipped with valves and pressure gauges as ordered.

The Goodman-Cylindrical Stopper is an inflatable bag with a fine strong waterproof casing for use in gas and oil pipes. This stopper is pulled into place by cables and will hold back high pressures.

The Gardner-Goodman Stopper

The Gardner-Goodman Stopper consists of an inflatable bag mounted in a brass cylinder with plunger for safe and easy insertion and comes equipped with a gauge. For use on cast iron or steel, standard, oversize or undersize mains. Easily inserted in top, bottom or side of main in open excavation or under pavements.

PARANITE

Styles C., M., and No. 27

We compliment the Natural and Manufactured Gas Industry on their N R A Codes under which they are employing more field labor in re-rubbering old lines and adding new lines equipped with Paranite Gaskets. Over 10,000,000 Paranite Gaskets in use.

NRA MEMBER U.S. WE DO OUR PART

Left: Bell clamp joints "going down" with Paranite to *permanently* seal them. This is a new mixed gas line where Paranite has been specified. The gas will have no harmful effect on the gaskets.

Paranite gaskets are furnished in three types—Paranite 27 and Paranite M for manufactured and mixed gases and Paranite C for natural gas. Each type of gasket is designed to withstand the most adverse conditions that may be encountered, and permit adequate expansion and contraction of the joint without leakage.

TRADE PARANITE MARK

Paranite is a specially compounded formula manufactured exclusively by us. Name registered in U. S. Patent Office.

It's safest to specify Paranite

Paranite Pipe Joint Gaskets are distributed by Pipe Joint Manufacturers

The Manhattan Rubber Mfg. Division

of RAYBESTOS-MANHATTAN, Inc.

Executive Offices and Factories

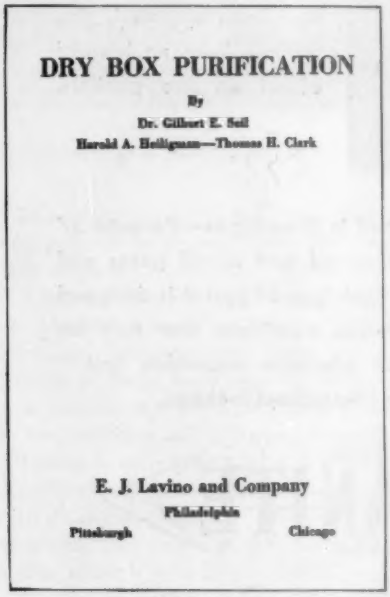
Passaic, New Jersey

Dry Box Purification

The firm of E. J. Lavino and Company was established at Philadelphia in 1887 by Mr. E. J. Lavino, the original business being that of importing ores, metals and other merchandise. As the years passed, other lines of endeavor were undertaken and the activities of the Company now embrace mining, manufacturing, exporting and shipping in addition to importing and merchandising.

In collaboration with the various operating Companies the Company maintains a Technical Department in charge of Dr. Gilbert E. Seil at Plymouth Meeting Pa., where a fully equipped Research Laboratory is available for the study of means for the better and more efficient use and application of the products in which E. J. Lavino and Company are interested.

The complete chemical and physical equipment of this Department with its analytical and control laboratories is also available for assistance in any technical problem to the customers of the Company.



Among other problems which have been given attention by the Technical Department are Dry Box Purification and the various methods of operating boxes together with the effect of added oxygen and other variable factors. This subject has been carefully studied, the conclusions being set forth in a clear and concise manual "Dry Box Purification" which is available to all those interested.

The continued study of purification practices has shown that many plants are interested in obtaining a material suitable for use without shavings or other lightener. Additional research led to the development of a granular Oxide, which the Company expects to produce in commercial quantities upon the completion of practical tests. The granules are said to be of a porous nature allowing full penetration of the gas and, having no carrying medium, there are no inactive elements present.

Iron Boring Oxide

There are various ways of abstracting the impurities from the raw gas before it goes to the consumer. Iron oxide and its hydrated forms is extensively used for the removal of hydrogen sulphide from manufactured and natural gas. The hydrates vary in color from light yellow to dark browns and reds; some are chemically inactive whereas others exhibit a strong affinity for hydrogen sulphide and organic sulphur compounds.

These various forms of iron oxide are available from several sources, first, natural bog ore deposits; second, by-products of chemical industries; third, precipitation from solutions of iron salts and fourth, from the oxidation of chemically treated iron borings.

It is this iron boring oxide that is produced by the Gas Purifying Materials Co., Inc., makers of G.P.M. iron hydroxide. Chemically treated cast iron borings are ground and screened to a uniform mesh and scientifically mixed with wood shavings. The mixture is then spread on concrete slabs to compete with nature in producing an active "rust" that penetrates the fibers of the wood and does not wash off. Their plant is virtually a large Weather-O-Meter in that rain and heat are scientifically supplied when needed to produce an active form of iron hydroxide.

The G.P.M. Co. pride themselves on this scientific development and when visiting their plant, the point is stressed that the product is uniform since it is not dependent upon a particular active strata of bog ore or the sludge of a chemical process.

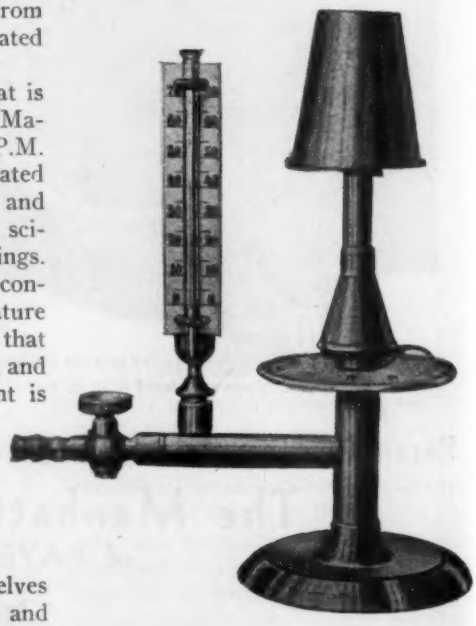
Alpha-Lux Products

Alpha-Lux Company, Inc., New York, N. Y., state that Lux material has been in the service of the gas industry for over 50 years. Lux is a ferric hydroxide. It contains on a dry basis about 50% to 59% ferric hydrate. It is in a collodial state, contains no free iron and may be stored indefinitely without heating up.

The company also markets the Dr. Strache-Kling hand colorimeter for determining the heat value of gases. It is portable, weighs under 10 pounds, and determination can be made in one minute.

Another product is the Lux recording gauge for recording the specific gravity of manufactured gas. It is designed to give at a glance any changes that have occurred at any time, and also a permanent record of the specific gravity of gas every hour of the day.

The Dr. Ott Lux Gas tester combines in one operation gas analysis, specific gravity determination and calorimeter tests.



Dr. Ott-Lux Gas Tester

The *FIRST* real advance in Dry Box Purification since the adoption of Oxide of Iron for the removal of H_2S.

No uncertain conversion from metallic to oxidized Iron. No reliance on a product of Nature as in the case of Bog Ore and distinctly not a By-Product.

Instead it is manufactured at our Lynchburg, Virginia, Plant under close chemical control, the resultant product embracing:

High Active Ferric Oxide
Low Free Moisture
Fine State of Division
High Degree of Uniformity

Lavino Activated Oxide is bought and rebought by Gas Engineers seeking simplicity of operation and low purifying costs. Why not join their ranks?

Supplied unmixed and mixed.

E. J. LAVINO and COMPANY

BULLITT BLDG. - PHILADELPHIA, PA.

CHICAGO **PITTSBURGH**

An Amazing Growth In the Development of Appliances

IN REVIEWING the growth and development of apparatus and appliances for the utilization of gas a study of the records of one hundred years ago discloses that, at that period, virtually no scientific laws were applied in the design of gas lighting burners and fixtures, the then only devices for utilizing gas; essentially, appearances and accommodating the exposed portion of the fixture to a given space were the determining factors.

Stepping ahead some sixty years to the time of the World's Columbian Exposition in 1893, we find that space heaters of somewhat arabesque design as well as gas ranges and what might be called rudimentary water heaters were also being offered for sale by various gas companies. But even here one notes a more or less glaring lack of the application of scientific study to burners, proper proportioning of combustion space and similar matters.

Approaching the present time still closer one might definitely say that the work undertaken by the United States Bureau of Standards, the U. G. I. Appliance Testing Laboratory in Philadelphia, the Welsbach laboratory in Gloucester City, N. J., and similar but somewhat less extensive efforts on the part of a handful of other gas companies marked the first definite steps in scientifically studying gas appliances. And this period might well be said to include a space of not considerably longer than twenty years.

The final period, which finds its appliance investigations dictated by sound engineering and scientific laws and principles, had its inception in the establishment of the A. G. A. Appliance Testing Laboratory in Cleveland. Meanwhile, to their credit, it must be said, most of the appliance manufacturers kept actively informed on the findings of the various laboratories and incorporated the same in each succeeding new model. Today, then, no newcomer in the appliance manufacturing field could hope for any continuing success without closely following the ever widening trail blazed by accurate laboratory investigation.

Truly an amazing growth! Without it our industry would now be in a state of rapid decline. Follows a brief description of the most up-to-date gas appliances.

Crown Stove Works, Chicago, Ill.

There is a New Deal in gas ranges, as well as in national politics. A New Day has dawned. Nobody seems to know just why but most manufacturers recognize the fact that today the public demands something more than just a stove that cooks and uses gas for fuel. The spectacular, vari-colored models on display at recent shows indicate plainly the trend toward beauty as well as utility, efficiency and convenience.

Crown De Luxe Buffet Gas Range

Crown Stove Works was among the first to recognize that the American housewife would no longer be satisfied with a stove that her grandmother considered the last word in convenience. As far back as 1927, Crown realized that the old-fashioned gas range lacked sales appeal, that the public would no longer be satisfied with "just another gas stove."

Following the hectic period in which manufacturers sought to use color as a sales argument, Crown engineers made a real forward step in range design, by producing Buffet and Console ranges, which revealed that it was possible for the kitchen to be as modern—and as beautiful for that matter—as the living room.

Today, old-type gas ranges, with exposed valves, gas cocks and burners are obsolete. There are no more exposed manifold pipes to mar the beauty of the finished range. All are concealed. Not only is this type of range more attractive but it is also safer and insures proper and efficient combustion of gas, due to the patented construction of the manifold door. When range is in use, the Safety Manifold Door is open allowing sufficient air to reach the burners. The possibility of overheating valves is eliminated—no sticky valves to cause trouble no heat pockets to warp or ruin the range.

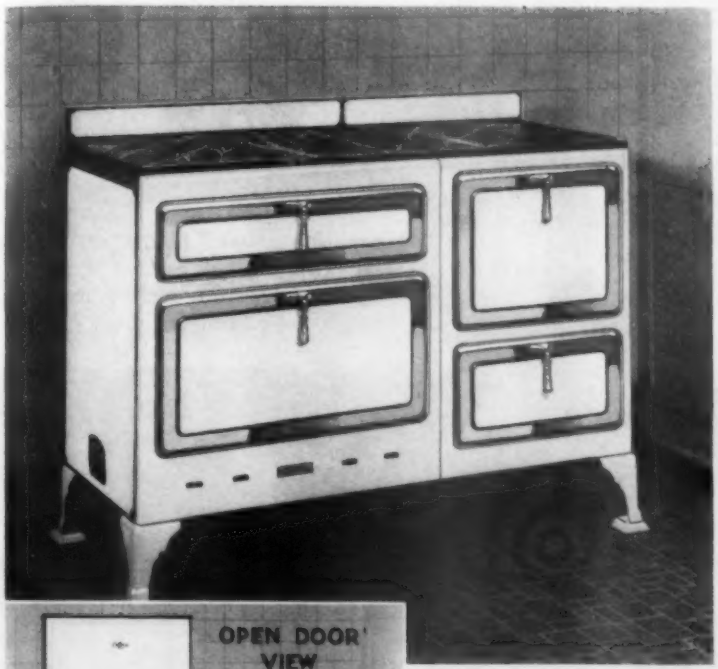
Crown's patented lift top, serves as a table top when the range is not in use and as a "splasher", protecting walls from splashes and stains when the range is in operation.

Added to these are the Automatic Top Lighter, designed by Crown to meet electric stove competition and with which no matches are required. You simply turn the gas cock and the burner is lighted, like an electric stove. There is also the Slide-out Broiler, which makes it unnecessary to stoop over a hot oven to inspect the food being prepared because the entire broiler slides out like a drawer and foods can readily be inspected without burning the hands.

The Oven Heat Regulator has been fashioned like the familiar radio dial, conveniently placed so as to be always easily read, yet out of the way of pots and pans, and the insulated feature of the oven insures users a cool kitchen.

A method was devised to reproduce marble graining by the porcelain enameling process. The "marbleizing" was developed by etching a real marble slab with acids and then transferring the impression onto steel. It was possible to produce an enameled surface that could hardly be distinguished from the original.

A MASTERPIECE
of the Stove Builders Art



It's a

CROWN

DELUXE SIX BURNER BUFFET GAS RANGE

TWO OVENS— {one standard size / one extra large
SLIDE OUT BROILER
SPRING GREEN and IVORY PORCELAIN
CHROMIUM DOOR FRAMES
MARBLEIZED TOP

CROWN PATENTED FEATURES ARE WELCOMED BY ALL

- a. Patented Safety-manifold door. All gas cocks are concealed. When door is open, sufficient air is allowed burners to insure proper combustion of gas, with no possibility of overheating valves or making them stick—no heat pockets to warp or ruin range.
- b. Patented Safety Top Lighter eliminates need of matches to light burners.
- c. Conveniently placed oven heat regulator. Pots and pans cannot strike it.
- d. Ovens scientifically insulated to keep kitchen cool.
- e. Patented Convertible Top and Splasher protects walls from staining and hides burners when range is not in use.
- f. Patented Slide-out broiler eliminates stooping when inspecting foods also possibility of burning hands.

Original—Distinctively Different —Beautiful *Embodies every Modern Scientific Device to Simplify Cooking and Baking . . .*

This CROWN range has been accepted by the trade with more enthusiasm than anything we have ever produced—not only because of its BEAUTY—ORIGINALITY and SPECIAL FEATURES—but because it permits the concentration of sales efforts in a market that has hardly been touched, viz: homes requiring a range of large capacity.

Customers of this type are accustomed to pay cash for their equipment or have sufficient credit rating to render their account desirable.

The CROWN line has proved itself to be a stimulant in securing new business, because it offers prospective customers attractive replacement propositions—a wide choice of models—individuality—at a price that is both attractive to the user as well as to the utility company from the standpoint of mark-up.

Send for complete catalog and proposition.

CROWN STOVE WORKS

MANUFACTURERS OF THE LARGEST AND MOST COMPLETE LINE OF BUFFET AND CONSOLE RANGES

4627 W. 12th PLACE . . . . . CHICAGO, ILL.

A colonial kitchen, 1833. Note the amount of labor required to keep house in a home like this. Wherever we look we see labor for the housewife. No wonder the women of a hundred years ago died young.

A Century of Progress Exposition

American Stove Company was chosen by A Century of Progress to tell the complete story and development of the domestic gas range. The American Stove Company, keenly aware of the fear entertained by the gas industry that the electric range manufacturer would "steal the show," decided that because of its duty to the gas industry it would accept the proposal of the exposition.

In Home Planning Hall is a comprehensive exhibit of Red Wheel gas ranges including, of course, the Magic Chef line.

The outstanding feature that has caused most comment is a booth which houses six period kitchens in miniature. They range from 1833 to 1933. Faced with the problem of showing the development of cooking for a hundred years, it was decided that the use of miniature kitchens would be the best way. A competent designer was employed to make the necessary research and construct such kitchens.

Considerable comment has been aroused, many people writing to American Stove Company for further information about these kitchens. As far as it is known, they are the only authentic studies in existence of American kitchens.

A glass case encloses an exhibit of gas burners from the earliest sawed-type burner to the latest Magic Chef "burner of a thousand heats." This same case contains sample regulators from the first experimental model to the latest Lorain.

Nearby to Home Planning Hall are eight model homes erected under the control of the exposition. In five of these model homes, Magic Chefs have been installed.

An 1860 kitchen when housewives talked of Lincoln and the problem of slavery

The exhibit of American Stove Company is the only exclusive gas stove display of the exposition.

In 1888 women began to enjoy the luxury of gas cooking

The Development of Gas for Cooking

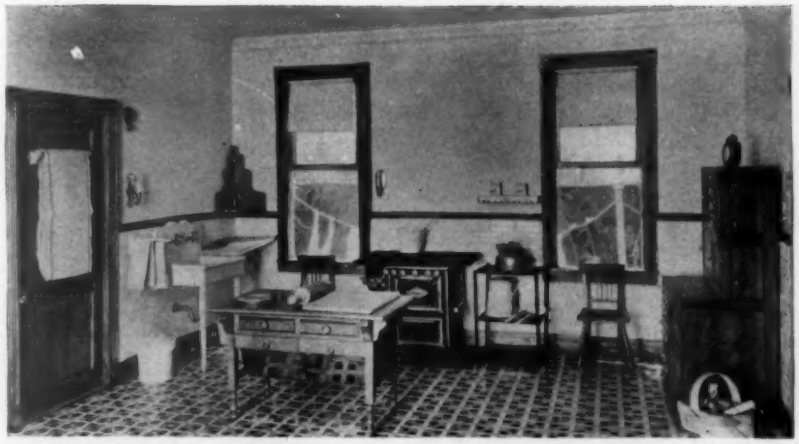
The development of gas for cooking and the development of American Stove Company are synonymous. Gas was first promoted as an illuminant, as an ideal substitute for the oil lamp, which in turn, had superseded the candle. After gas had begun to be established for lighting purposes, sundry inquiring minds, noting its cleanliness and ever ready availability, began to experiment with gas as a fuel.

American Stove Company in its inception was a number of isolated factories producing as their major product liquid fuel stoves, which included oil and gasoline. Oil was used with a wick (in fact, were glorified lamps) but gasoline was burnt as a

gas. That is, each gasoline stove was a miniature gas plant manufacturing its own gas.

Hence, when over half a century ago, the attention of the public was turned towards the use of gas for domestic cooking purposes, what was more natural than that American Stove Company should turn to the manufacturing of gas stoves.

Rapidly the gas range was developed during those pioneer days. Eventually, the improvement of the gas range became static. It had reached, seemingly, the zenith of efficiency and design. Still feeling the urge for improvement the engineers of the industry began to improve the appearance of the stove, which, up to this time, had been neglected.



The year of 1903 saw the growth of gas for cooking

Porcelain enameled parts were added in a timid feeling out of the public's taste. It began with gas cock handles and door panels. Then enameled splashers were added. The use of porcelain enamel was extended, till, in time, the entire gas range inside and out was finished in porcelain enamel. This improved the gas range mightily, but added not a jot to the service of the gas range.

1920 found gas used universally for cooking

American Stove Company's engineers, curious as to why the service of a gas range had never been improved, did some experimenting. In 1915 a skeptical world was startled by the presentation of the Lorain Oven Heat Regulator.

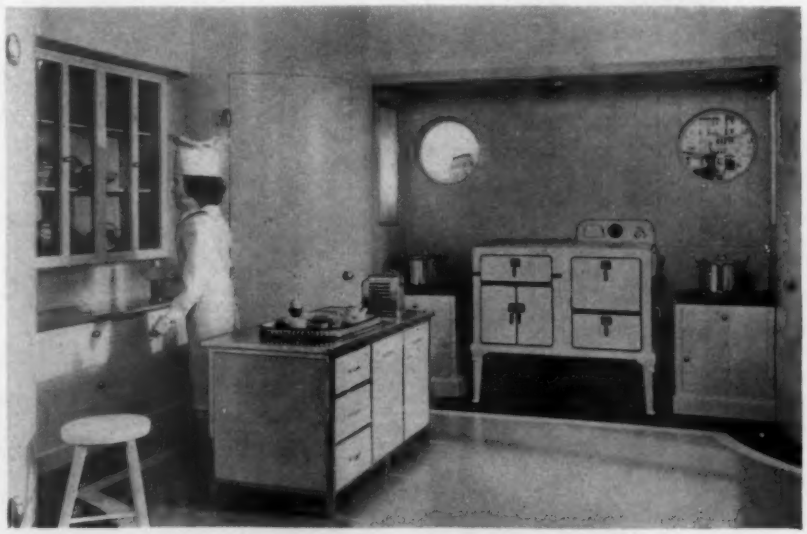
The idea of regulating oven heat progressed slowly until in 1919 American Stove Company began national advertising to educate women to "time and temperature cooking." This has continued uninterrupted ever since.

In 1929 American Stove Company again offered a new type of gas range, Magic Chef. Not only was Magic Chef designed for greater beauty, but the cooking-top end was improved as well.

Officers of American Stove Co., many of whom have served a lifetime with the organization, are:

C. A. Stockstrom, Chairman of the Board; Louis Stockstrom, President; Arthur Stockstrom, Secretary; George F. Fiske, Treasurer; Thos. Rath, Vice President in Charge of Publicity; S. E. Little, Vice President in Charge of Sales.

Robert K. Clark, Vice President and Manager, George M. Clark & Company Division; I. W. Peffly, Vice President and Manager, Export Department; W. J. Hoven, Manager, New Process-Reliable Stove Co. Division; T. M. Sourbeck, Manager, Oil & Gasoline Stove Co. Division; A. F. Millikan, Manager, Northern Sales Division; R. L. Kahle, Manager, Southwestern Sales Division; J. H. Kirby, Manager, Central Sales Division; W. E. Kirby, Manager, Atlantic Sales Division; C. A. Young, Manager, Eastern Sales Division; J. C. Brown, Manager, Southeastern Sales Division; E. P. Millikan, Manager, Pacific Sales Division.



The ultra modern kitchen of 1933

American Gas Products

The American Gas Products Corporation, division of American Radiator Company, originally was organized in 1903 as the A. H. Wolff Gas Radiator Company. Its first years were devoted to the manufacture and sale of tubular gas-fired steam radiators, reflector heaters, etc.

In 1919 it began distributing the A. H. Wolff Gas-Fired Steam Radiator, the sections of which were cast and assembled by American Radiator Company. Soon after this, the company became the distributors of Ideal Gas-Fired Boilers for American Radiator Company. In 1926 the corporation name was changed to American Gas Products Corporation and in July, 1931, it became a division of American Radiator Company.

Thus, this corporation has a background of more than 30 years in manufacturing and selling gas heating appliances. Today, its wide and complete line includes heating boilers, air-conditioning equipment, automatic storage water heaters, conversion burners, gas-fired steam radiators and space heaters.

Officers and executives of the American Gas Products Corporation are: W. T. Rasch, President; E. R. Downe, Vice President; H. Leigh Whitelaw, Vice President; F. J. Mullany, Secretary-Treasurer; H. H. Dugdale, General Manager of Sales.

A.G.P. Gas-Fired Air Conditioner

To meet the growing demand for gas-fired air conditioning, the American Gas Products Corporation in cooperation with American Blower Corporation, another subsidiary of American Radiator Company, has developed the A.G.P. Gas-Fired Air Conditioner. It was designed more than two years ago and has been subjected to the most drastic tests under actual home conditions. Today, it meets all the requirements of complete air conditioning by heating and humidifying in winter, and cooling, ventilating, dehumidifying and circulating the air in summer.

6 Col. Unvented Radiator

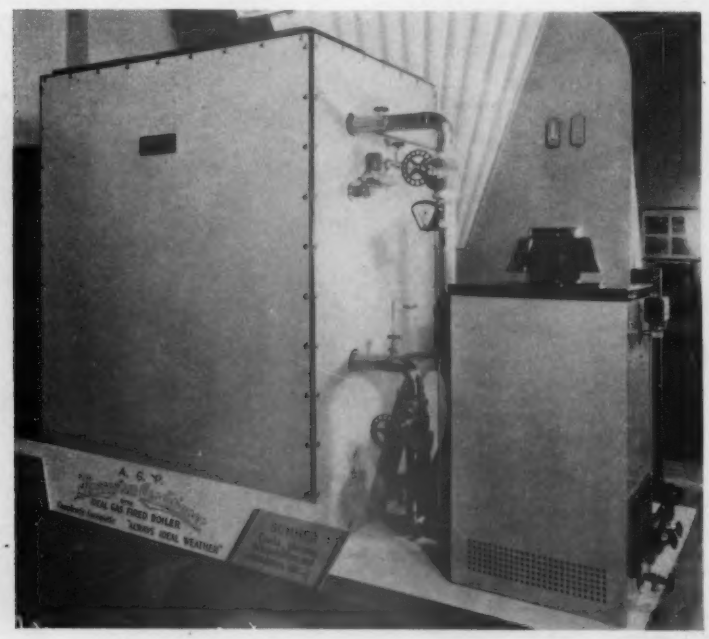
This unit is automatically and dependably controlled for temperature, humidity, pressure and water supply. Once the unit has been installed and put into operation it automatically keeps the air at the temperature desired, the humidity as required and the circulation of air as needed. Sizes and models are available for every type of home or building.

A.G.P. Unit-Or

The A.G.P. Unit-OR embodies entirely new principles designed to produce warm air in large quantities uniformly distributed throughout the room. A specially constructed inner cover jacket directs the heated air through an artistically designed grill located in the front cover, thus preventing the heated air from reaching the ceiling too quickly, insuring evenness of room temperature.

A.G.P. Gas-Fired Unit-OR

A convenient knob, located on top of the control is easily adjusted to maintain the desired temperature. The heater is so designed that it can be used as either a vented or unvented appliance without material change or addition to the heater.



A.G.P. Air Conditioner with Ideal Gas Fired Boiler

A.G.P. Gas-Fired Steam Radiator

A.G.P. Gas-Fired Radiators represent one of those rare combinations in which beauty unites with high efficiency. A.G.P. Gas-Fired Steam Radiators are of the "American Corto"

Leadership

IN

GAS-FIRED HEATING

DEPENDABLE AGP PRODUCTS

IDEAL GAS BOILERS

Completely and automatically controlled to assure minimum operating cost and maximum safety. Thermostatic pilot and all other boiler controls are mechanical in their operation and are centered in the celebrated A. G. P. throttling gas valve. Enclosed in attractive Armco iron jacket vitreous enameled on both sides . . . heavily insulated.

IDEAL GAS CONVERTOR

Another A. G. P. triumph! Offers the outstanding method of changing any type of furnace or round boiler into a highly efficient, economical, automatic gas-fired heating system. All controls are mechanical and centered in one valve. Fits all types of round boilers and furnaces. Special equipment makes it a "tailor-made" job for Arco Round Boilers, eliminating engineering on the job.

NRA

AMERICAN GAS PRODUCTS CORPORATION

40 WEST 40th STREET, NEW YORK, N. Y.,

Division of AMERICAN RADIATOR COMPANY

NRA

design, beautiful in appearance. Equipped also with the new In-Airid, the invisible air valve, which insures complete radiator venting, A.G.P. Gas-Fired Steam Radiators are equipped with the A.G.P. Thermal Control which gradually throttles the gas supply as the *internal* radiator temperature increases.

American Gas Products Corporation features two types of automatic storage water heaters—A.G.P. and The Dictator. Each combines the highest efficiency with improved principles of design and sturdy construction. Each is perfectly controlled through a single valve.

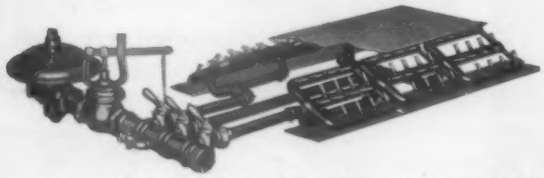
A.G.P. Gas-Fired Automatic Storage Water Heaters are made in both galvanized and Everdur tanks. Complete automatic controls are all centered in one valve. It is snap-acting, positive and dependable. Easy accessibility permits easy regulation. Positive thermostatic pilot automatically cuts off gas supply to main burner unless pilot is lighted. The A.G.P. is made in 20, 25, 30, 40 and 75 gallon sizes.

Dictator Water Heater

The Dictator Gas-Fired Automatic Storage Water Heater is built with the same careful attention to detail of design and construction as found in the higher priced line. It has a heavy blanket of rock wool insulation on sides and top, heavy cast-iron base and legs, heavy tank construction. It has snap-action thermostat and bi-metallic pilot. Made in galvanized or Everdur tanks in 15, 20, 30 and 40 gallon sizes.

Barber Burners

House heating with gas as a fuel is attracting more and more the attention of the public. A great amount of research and engineering work has been done in this field. Many types of burners and house heating apparatus have been developed both of the gas-fired built-in type and burners for converting heating apparatus from other fuels to gas. The Barber Gas Burner Company, Cleveland, O., was one of the leaders in the development of various types of burners to fit different types of furnaces.



Special Four Unit Burner and installation in Oblong Boiler

The combustion principle of the Barber Jet Gas Burner provides for the introduction of auxiliary air above the gas orifice in the jet tubes. As the premixture leaves each pair of jets, a vacuum is created which draws into the flame the additional air required to develop perfect combustion upon increased gas pressure. The combustion is dependent upon its union with a proper amount of oxygen as may be extracted from the air. Note how the Barber Patented Jet Principle combustion is obtained, liberating all the heat contained in the gas.

The Barber Jet Burner develops a flame temperature of 1900° F. with 550 B.t.u. gas. It is not affected by dirt, corrosion or condensation and will not back-fire or deposit carbon under any pressure. Illustrations show how the Barber Burner throws the flame directly to the place where it is needed and the heat hugs and scrubs the heating surfaces of furnaces or boilers.

The illustration shows the Barber Automatic Burner installed in a round Steam or Hot Water Boiler. It shows the proper adaptation of the heat to the side walls at the proper water level, utilizing all of the B.t.u. developed from combustion. In order to service all sizes of Steam and Hot Water Boilers, this burner is provided in seven standard sizes and diameters.

Another illustration shows the installation in a square or oblong sectional boiler. Burners are built to fit each size of boiler.

Range Lighters

One of the most convenient attachments to the up-to-date gas range, is the gas lighter. The Milwaukee Gas Specialty Co., Milwaukee, Wis., has been making lighters for many years. Their latest lighter is the Rutz-O-Matic.

This lighter was offered to the trade approximately twelve months ago after their engineers had experimented with it for almost three years. It is extremely important that an automatic lighter ignite the burners in the shortest possible time and that the lighter will re-ignite all of the burners in case they may be snuffed out at any time whether the burners are operating full on or on a simmering position. The Rutz-O-Matic is capable of meeting both of these specifications. A number of these lighters have been approved on ranges that have passed through the American Gas Association Laboratory during the past year.

The Milwaukee Gas Specialty Company has been engaged in manufacturing gas appliance accessories for approximately twenty years. The business was founded on the Rutz Push Button Lighter which for a long time was standard on every gas range manufactured in the United States. Besides the Rutz Push Button lighter and the Rutz-O-Matic lighter they manufacture a domestic gas range thermostat known as Thermolator, a concussion proof thermo safety pilot, gas cocks and fittings of all kinds.

The active head of the Company is Mr. O. J. Leins, Vice-President, who has been identified with the Company for the past twelve years. Mr. O. F. Pfeil is President and Mr. H. E. Toelle is Vice-President.

Show Them how It's done With BARBER *Automatic* JET GAS BURNERS

BUILD YOUR HOUSE HEATING LOAD WITH THE CONVERSION BURNER TH AT ALL OTHERS STRIVE TO EQUAL IN PRICE, ECONOMY AND EFFICIENCY

The conversion of coal fired Furnaces and Boilers to efficient Gas heating appliances is acknowledged by the leading Gas Companies as the ideal load building plan.

A BARBER AUTOMATIC JET GAS BURNER once properly installed insures a permanent satisfied gas customer.

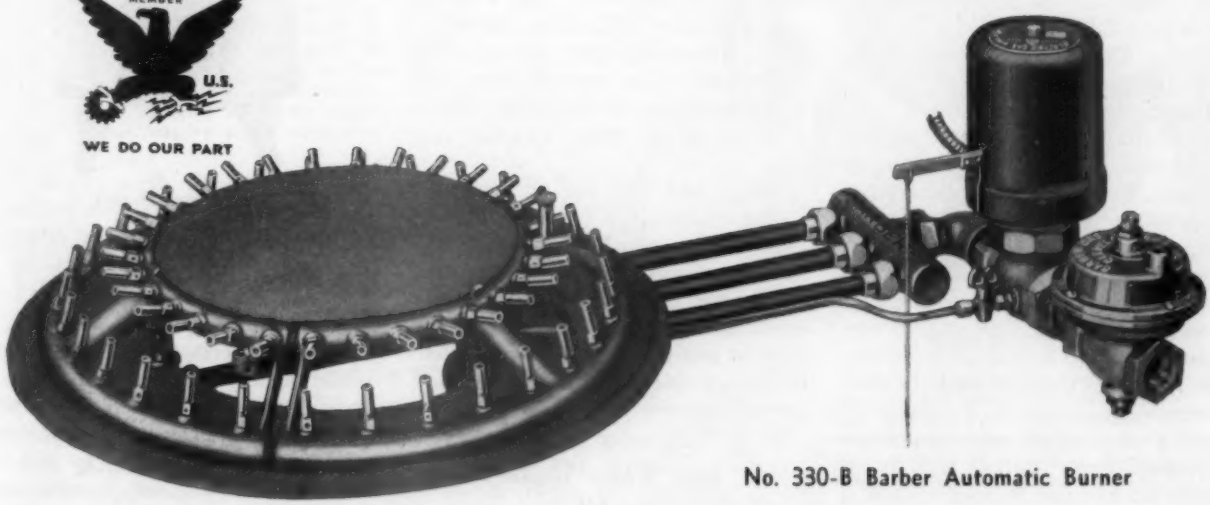
There is a BARBER BURNER for every size and type heating appliance. Tailor Made for the individual job, it supplies proper application of the heat without expensive refractory materials.

BARBER BURNERS are easily and quickly installed, service free and will operate indefinitely without attention or repairs.

Illustrating No. 324-B Barber Burner installed in a Round Boiler

NRA MEMBER U.S.

WE DO OUR PART



No. 330-B Barber Automatic Burner

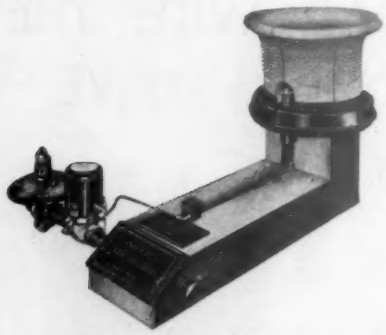
Write for complete Catalog and Literature and new prices

THE BARBER GAS BURNER CO.

3702-04 SUPERIOR AVE., CLEVELAND, OHIO

Roberts-Gordon Burners

Roberts-Gordon Appliance Co., Buffalo, N. Y., are pioneers in the design and construction of gas fired conversion burners for all types of furnaces and boilers. Illustration shows one of their latest models. All



Roberts Standard Burner

models are built in various sizes, and are equipped with gas pressure regulators, motor gas valves and thermostat. They also have complete air control so designed as to prevent cold air entering and cooling the fire pot when the burner is not in operation.

Water Heaters

The Ruud Manufacturing Co., Pittsburgh, Pa., with a long established policy of building a complete line of gas water heater types and sizes for every water heating requirement, are continually doing research work and adding to their line new models. One of their latest models is the newly improved Ruud-Autohot automatic storage water heater.

In it, gas is now controlled with the Ruud All-Metal Thermostatic Moment Valve which has a shortened temperature range, serving to increase the hot water capacity of any given tank. Important selling features have been retained such as the all-metal automatic gas cut-off, replaceable tank, heat-sealing insulation, full-front mechanism and quickly-removable burner assembly. Three sizes are built with copper and galvanized iron tanks. Galvanized models may be had with or without a clean-out hand-hole for hard water.

Another popular automatic storage water heater to be featured in 1934 is Autohot C. C. with its customer-controlled gas bill. This is accomplished with the C. C. Burner and its three adjustments which burn three graduated quantities of gas and furnish a hot water supply in proportion.

The advantage to the owner is twofold; he can experiment with the three simple adjustments until he finds the one that will give him hot water without lack or waste, and further he can by this regulation set the burner to consume the amount of gas that he selects and no more.

There are 57 Ruud heaters of various types and sizes in service at the Century of Progress Exposition at Chicago.

Gadgets Sell Gas Ranges

Estate Stove Co., Hamilton, Ohio, have made many improvements in their line of gas ranges. Regardless of age, make, or previous condition of servitude, a gas range will usually continue to bake, roast, stew, boil or fry, at least after a fashion. During the late financial stringency, this fact made replacement sales of gas ranges hard to get—the beauty, efficiency and convenience of modern ranges notwithstanding.

Recognizing the need for extra sales appeal to offset this condition, the Estate Stove Company added to the 1933 Estate Gas Range line a galaxy of gadgets which has turned the tide in favor of many a sale when the prospect was at the point of deciding to "wait until times got better."

Among these are the Utilitoaster for gas or electricity; the cooking-top lamp; the clock which can be had as an automatic time control or as an ordinary time keeper; the owner's monogram in chromium letters, proclaiming the range as "her very own."

Other additions are an improved sliding cooking-top cover; a drawer-type broiler which is mechanically raised or lowered by means of a handle on the outer door panel; chromium steel ornamentation; a utensil drawer equipped with a condiment set in a convenient removable rack, and a knife sharpener.

Rex Water Heater

The present day automatic water heater, which is probably one of the greatest home conveniences, is the result of a vast amount of research work. The Cleveland Heater Co., Cleveland, O., say that science has demonstrated that automatic hot water heating is far more than a gas problem. It is a mechanical problem, plus a chemical problem.

Only when both of these problems have been solved and co-ordinated can automatic water heating afford dependable life-long service.

There is required an organization of skilled specialists in the fields of mechanics and chemistry, supplementing, and cooperating with, specialists in the laboratory and research department.

Engineers are said to be more honest than ordinary mortals, because by education and habit they think in exact figures. Exactitude with them is even more than a habit—it is a state of consciousness whose ruler is

Rex Water Heater

mathematics. It can be truly said that Rex water heaters are made in a plant whose every atmosphere is surcharged with a spirit of accuracy.

The engineering staff is not committed to any predetermined or arbitrary type—these men face their water heater problems with open minds ready and willing to pioneer where efficiency gives promise and encouragement. Safely sane, they will not urge radical changes in design for novelty or advertising effect—they are broad-gaged men, proud of their reputations as progressive exponents of water heating principles which are growing in use and in popularity.

Ready at the start-

FOR A GREAT RECOVERY

HOME HEATING SEASON

STANDARD BURNER

Complete thermostatic control. Made in four sizes to fit all sizes of round boilers or furnaces. Equipped with self-supporting radiants. New adjusting screw for regulating supply of air, insuring proper combustion.

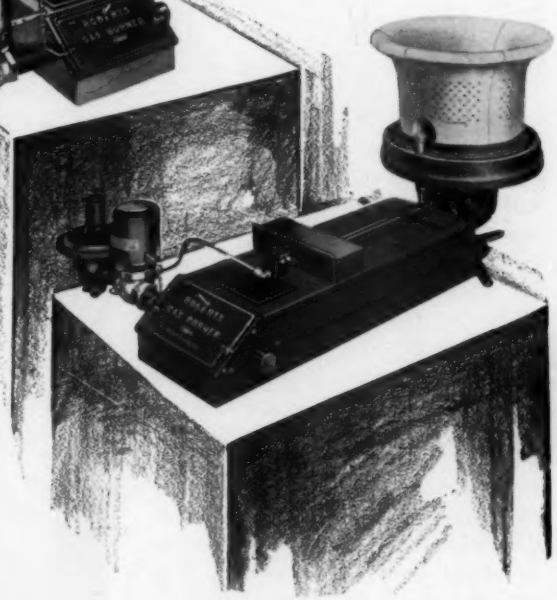
RECTANGULAR BURNER

Made in three standard sizes:

Dimensions of Burner	For grate dimensions
10″ x 17″	12″ to 18″ by 19″ to 25″
12″ x 22″	13″ to 22″ by 23″ to 33″
18″ x 28″	20″ to 30″ by 29″ to 39″

Other sizes made to specifications.

Equipped with self-supporting radiants. New adjusting screw for regulating supply of air, insuring proper combustion.



G TYPE BURNER

Complete thermostatic control of remote manual control with automatic pilot. Made in three sizes. Equipped with self-supporting radiants. New adjusting screw for regulating supply of air, insuring proper combustion.

Away with the starting gun on the great national race for recovery, Roberts-Gordon arms its distributors with three outstanding burners, each burner the best of its kind—constructed with engineering skill to insure perfect performance and inbuilt ruggedness to insure long life and a minimum of servicing.

Roberts-Gordon offer a complete line of Controlled Gas Heating Units for heating the smallest home or the largest commercial buildings.

National home improvement is definitely under way. The public is buying. Get your share of this rich market. Sell the complete Roberts-Gordon line.

Prompt shipments assured from conveniently located warehouse stocks

ROBERTS-GORDON APPLIANCE CORPORATION

BUFFALO **NEW YORK**

Robertstrow Thermostat

Robertstrow Thermostat Co., Youngwood, Pa., have steadily progressed in the perfecting of domestic and industrial Thermostats. Their space heater thermostat has a patented non-clog by-pass which controls the minimum burner or by-pass flame.

Their water heater thermostat is straight lift construction, for storage tanks up to 40 gal. capacity. It is a single unit and is equipped with thin non-clog by-pass.

One of their latest items is the coffee urn thermostat. It is applicable to practically all sizes and types of urns. Thermostat action is secured by means of a couple extending into the water chamber of the urn. This couple is composed of two rust-resisting materials. They make thermostats for all types of gas burning appliances.

Gas Automatic Refrigeration

Away back in prehistoric times, man discovered how to make heat. But not until less than two hundred years ago did he learn how to make "cold."

Even after the first steps were achieved, automatic refrigeration for the home continued to be only a scientist's dream. And most young people can easily remember when automatic refrigerators first appeared in their communities.

However, once automatic refrigeration passed from the experimental to the practical stage, its economic advantages were so obvious that a new industry came into being almost overnight.

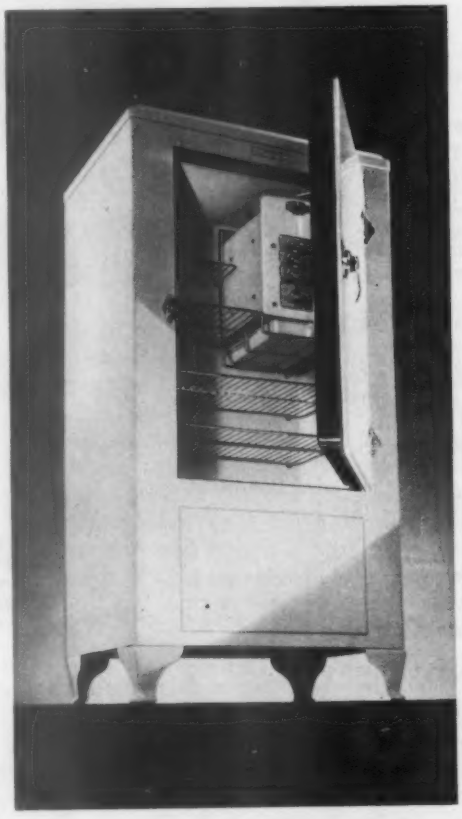
While manufacturers were striving to minimize the noise of early types of automatic refrigerators, two students—Baltzar von Platen and Carl G. Munters—at the Royal Institute of Technology, Stockholm, Sweden, were experimenting with an entirely new type. They hoped not to minimize the noise but to eliminate it entirely by eliminating the moving parts that caused it.

It seemed to them that a refrigerant could be made to circulate, vaporize, and condense through the use of heat rather than machinery. Their experiments soon proved that their theory was correct. For moving parts, they substituted a tiny flame as silent as a candle's.

Their work soon passed from the field of experiment into practical application, and Electrolux, the gas refrigerator, was born seven years ago—a new type of refrigerator in which a tiny, silent gas flame makes possible efficient refrigeration without machinery.

There are no moving parts in the new Air-Cooled Electrolux and, consequently, no noise. A tiny gas flame costing but a few pennies a day silently carries on the work of refrigeration. At last, man makes ice and cold as silently as nature herself.

The operation of the new Air-Cooled Electrolux is constant. There is no stopping and starting but a steady crisp cold that protects food every minute of the day and night. It does not even stop for defrosting. A twist of a dial allows the temperature to rise just enough to defrost, without interruption of the cooling process. The temperature can also be regulated to speed up the freezing of ice cubes and frozen desserts.



Electrolux Refrigerator

The new Air-Cooled Electrolux with its many refinements stands as a fitting symbol of a century of progress in automatic refrigeration.

It is the product of the Electrolux Refrigerator Sales Co., Evansville, Ind.

EverHot Water Heaters

The EverHot Heater Company, Detroit, Michigan, manufacturers of EverHot and Par-X (Par-Excellence) Automatic Water Heaters, first began the manufacture of water heating units in 1920. The company pioneered in the shell type of self-contained automatic water heater, of which the EverHot is an example.

While, like most water heaters, the EverHot was an "assembled unit" in the beginning, today, the EverHot build their heaters completely in their own factories.

Originally, the activity of the EverHot Heater Company embraced only the manufacture and distribution of EverHot Automatic Water Heaters; a few years later, the Par-X was added to the line to provide a high grade automatic water heater, to provide a unit for every job.

The EverHot is a shell-type heater, while the Par-X is of the tubular type. Both units have complete equipment.

While the design of the original shell-type EverHot and the tubular Par-X have practically remained unchanged, many improvements and refinements have been made and added to these heaters. These heaters enjoy some features in common—both have the fast, gradual action, EverHot thermostat, and semi-bunsen burner combination, pilot safety, pressure safety, and high efficiency.

In addition to the features common to both, the EverHot carries standard equipment which includes a Gas Filter, Temperature Safety Cut-off, and the Exclusive EverHot Leakage By-Pass. This last feature—the EverHot Leakage By-Pass, is an outstanding achievement and is worthy of special mention. It has been the means of eliminating high gas bill complaints caused by leaking or dripping hot water faucets.

THE FIRST A. G. A. PRIZE CONTEST

on ELECTROLUX is

ALREADY A SUCCESS!

Sales returns for July show intensive, *productive* efforts on Electrolux in all parts of the country . . . For the hundreds of companies registered in this contest, there'll be no "dull months" *this* Fall!

GRATIFYING was the registration response of utility sales organizations to the first A.G.A. prize contest on Electrolux! Even more gratifying, if possible, is the way in which these companies have hung up Electrolux retail sales records during July!

And everything points to a profitable continuance of this Electrolux sales success during the months ahead! For the business is there. People are in a buying mood. They're refrigeration minded. And we have a product to offer that's far superior to competition.

It's not too late, even now, for companies who have not already signed up to get into the contest! Credit will be given for all Electrolux sales made since July 1st. The contest ends midnight, October 31st. And don't forget: all installations in your meter territory—whether made by yourself or by your sub-dealers—count in your total!

Prizes are $750 (first), $500 (second), and $250 (third) . . . worthwhile objectives! But there is even more than prize money to be gained by the company which gets behind this drive. Every Electrolux installed adds 1500 cubic feet to a customer's present requirements . . . gives a strong impetus to the sale of other gas-using appliances.

For further information, write at once to Mr. J. W. West, American Gas Association, 420 Lexington Avenue, N. Y. C.

Refrigeration Committee

AMERICAN GAS ASSOCIATION

420 Lexington Ave.... New York, N. Y.

At The Helm for 1933-1934

THE following officers, directors and section chairmen for 1933-34 will be elected at the Chicago A.G.A. Convention.

For President—**H. O. Caster,** Member of Executive Committee, Henry L. Doherty & Company, New York, N. Y.

For Vice-President—**P. S. Young,** Vice-Pres., Public Service Electric & Gas Company, Newark, N. J.

For Treasurer — **William J. Welsh,** President, New York and Richmond Gas Company, Staten Island, N. Y.

For Directors—Two Year Terms:

H. C. Abell, New Orleans, La.

Walter C. Beckjord, V. P. & General Manager, Boston Consolidated Gas Company, Boston, Mass.

Howard Bruce, Chairman of the Board, Bartlett Hayward Company, Baltimore, Maryland.

J. S. DeHart, Jr., Pres., Isbell-Porter Co., Newark, N. J.

F. C. Freeman, President, Providence Gas Co., Providence, R. I.

R. W. Gallagher, President, The East Ohio Gas Co., Cleveland, Ohio.

C. N. Lauer, President, Philadelphia Gas Works Co., Philadelphia, Pa.

B. J. Mullaney, Vice-President, The Peoples Gas Light & Coke Company, Chicago, Illinois.

Herman Russell, President, Rochester Gas & Electric Corp., Rochester, N. Y.

For Chairman—Natural Gas Department—**F. L. Chase,** Vice-President, Lone Star Gas Company, Dallas, Texas.

For Chairman—Accounting Section—**E. B. Nutt,** Hope Natural Gas Company, Pittsburgh, Pa.

For Chairman—Commercial Section—**N. T. Sellman,** Director, Sales & Utilization, Consolidated Gas Co. of New York, N. Y. C.

For Chairman—Industrial Gas Section—**F. B. Jones,** Director, Industrial Gas Sales, Equitable Gas Co., Pittsburgh, Pa.

For Chairman — Manufacturers' Section—**John A. Fry,** V. P. & Secy., Detroit-Michigan Stove Co., Detroit, Michigan.

For Chairman Publicity & Advertising Section—**Henry Obermeyer,** Consolidated Gas Company of New York, New York, N. Y.

For Chairman—Technical Section—**O. S. Hagerman,** Engineer, American Light & Traction Co., Chicago, Illinois.

Summary of Gas Company Statistics For June 1933

NATURAL gas sales for the month of June amounted to 56,338,800,000 cubic feet, an increase of nearly 3 per cent over the corresponding month a year ago. Both the manufactured and natural gas groups reported a distinct upturn in gas sales for industrial purposes. Sales of manufactured gas for industrial-commercial uses showed a gain of 5 per cent for the month. Natural gas sales to ordinary industrial customers gained 3.5 per cent, while sales to large scale industrial users increased more than 11 per cent. Total sales of manufactured gas reported for June equalled 28,482,500,000 cubic feet, a decline of 5.5 per cent.

Revenues of the manufactured and natural gas industry aggregated $51,063,000 for June 1933, as compared with $54,093,600 for June 1932, a decline of 5.6 per cent.

The manufactured gas industry reported revenues of $31,245,600 for the month, a drop of 8.4 per cent from a year ago, while revenues of the natural gas industry totalled $19,817,400, about equal to the figure reported for June, 1932.

For the six-months' period ending with June, revenues of manufactured and natural gas companies aggregated $366,556,100, a decline of 8 per cent from the first half of 1932.

The manufactured gas companies reported revenues of $195,554,800 for the first six months of 1933, or 9.8 per cent less than for the corresponding period of the preceding year, while revenues of the natural gas utilities amounted to $171,001,300 for the same period, a decline of 5.8 per cent.

—*Paul Ryan, A.G.A.*

Pacific Coast Gas Statistics

FIGURES for gas company operations, compiled by the Pacific Coast Gas Association, in the states of California, Arizona, Nevada, Oregon and Washington, and the province of British Columbia, for the first six months of 1933 and the similar period in 1932 are given below:

	1932	1933	Percent Change
Production—Mcf			
Water Gas	1,545,401	1,212,524	
Coal Gas	789,667	402,222	
Oil Gas	4,245,711	2,423,496	
Coke Oven Gas	349,966	815,496	
Butane Gas—550 Btu	153,696	132,567	
Natural Gas Purchased	68,797,121	75,576,203	
Total	75,881,562	80 562,508	+ 6.2%
Active Meters—June 30			
Domestic	1,528,632	1,504,486	— 1.6%
Commercial and Industrial	69,717	69,495	— 0.3%
Total	1,598,349	1,573,981	— 1.5%
Sales—Mcf			
Domestic	36,866.573	36,685,924	— 0.5%
Commercial and Industrial	22,824,082	25,417,913	+11.4%
Steam-Electric Generation	7,427,959	7,290,064	— 1.9%
Total	67,118,614	69,393,901	+ 3.4%
Gross Revenue			
Domestic	33,710,153	33,130,427	— 1.7%
Commercial and Industrial	7,212,324	7,479,197	+ 3.7%
Steam-Electric Generation	958,954	829,666	—13.5%
Total	41,881,431	41,439,290	— 1.6%
Miles of Main—June 30	26,306	26,151	
Number of Employes—June 30	11,307	10,362	

A CENTURY of PROGRESS

— The Age of Gas —

GEORGE WASHINGTON and George III enjoyed few if any more conveniences than were available to Julius Cæsar or Cleopatra. For nineteen hundred years there was practically no advance in the facilities that make for convenience and comfort.

Within the span of the century Chicago is now celebrating, we have come from crawling over the earth in ox-carts to flying through the air, a development that symbolizes the era.

Gas was the first big development in this Century of Progress. The first gas company started in London, England, in 1807. Gas lighted the way, and while the heat element in gas is now admittedly its most useful feature, it is still a fundamental requirement in the lighting business; manufacturers of electrical equipment are among the largest users of gas for the fabrication of their products.

In fact, gas enters into the manufacture of practically everything we use or wear, from shoes to hats, and motor cars to baby carriages. This Century of Progress might as reasonably be called "The Age of Gas" as "The Age" of anything else.

(Gas Company men from everywhere, visiting the Century of Progress Exposition, are cordially invited to call at our offices, 122 South Michigan Avenue, and make our acquaintance.)

THE PEOPLES GAS LIGHT
AND COKE COMPANY
CHICAGO

THE older Gas Companies in the United States and Canada were started in the following years:

YEAR	
1816	Baltimore, Md.
1823	New York, N. Y.
1828	Boston, Mass.
1832	Louisville, Ky.
1834	New Orleans, La.
1836	Philadelphia, Pa.
	Mobile, Ala.
	Pittsburgh, Pa.
1840	Cincinnati, Ohio
	Montreal, Canada
1841	Manchester, N. H.
	Toronto, Canada
1843	Halifax, Canada
1846	St. Louis, Mo.
1847	Fall River, Mass.
	Newark, N. J.
1848	New Haven, Conn.
	Paterson, N. J.
	Providence, R. I.
	Rochester, N. Y.
	Washington, D. C.
	Buffalo, N. Y.
1849	Quebec, Canada
	Norfolk, Va.
	Cleveland, Ohio
	Detroit, Mich.
	Syracuse, N. Y.
	Utica, N. Y.
1850	Chicago, Ill.
	Columbus, Ohio
	Hartford, Conn.
	Worcester, Mass.
	Kingston, N. Y.
1851	Hamilton, Ohio
1852	Indianapolis, Ind.
	Memphis, Tenn.
1853	Brockville, Canada
	Milwaukee, Wis.
1854	Belleville, Ill.
	St. Joseph, Mo.
	San Francisco, Cal.
	Toledo, Ohio
	Ottawa, Ill.
1856	Atlanta, Ga.
1857	Scranton, Pa.
	St. Paul, Minn.
1860	Portland, Ore.
1866	Oakland, Cal.
1867	Kansas City, Mo.
	Los Angeles, Cal.
1868	Omaha, Neb.
1869	Stockton, Cal.
1871	Minneapolis, Minn.
1873	Seattle, Wash.
1879	St. Johns, New Fd.
1885	Tacoma, Wash.
1887	Spokane, Wash.

Personals

Harry Clinton Abell, president of National Power and Light Company and an executive in others of the Electric Bond and Share group of companies, has resigned from all his posts with the system. Directors of Memphis Power and Light Company have accepted his resignation as chairman of the Board, but the directors of the other bond and share companies have not yet met since Mr. Abell expressed his intention of resigning all business connections.

Mr. Abell has been affiliated with various units under Electric Bond and Share management since 1921. His various resignations were brought about by a desire to sever all business connections and to retire from active business life.

Among the present offices held by Mr. Abell in the Electric Bond and Share group are the following: President of National Power and Light Company, vice-president of Electric Bond and Share Company, vice-president of Electric Power and Light Corporation, vice-president of New Orleans Public Service, Inc., chairman of the board of Memphis Street Railway Company and president and chairman of the board of West Tennessee Power and Light Company.

Among the other companies on whose boards Mr. Abel sat were Arkansas Power and Light Company, Latex Construction Company, of which he was also president, Louisiana Power and Light Company, Mississippi Power and Light Company, Carolina Power and Light Company, Tennessee Power and Light Company, Memphis and Lake View Railway Company, Southern Gas and Fuel Company and American Gas Association.

Roy B. Munroe, who for the past three years has been an engineer in the new business department of the Kansas City Gas Company, under M. B. Buckley, has accepted a position as supervising engineer in the new business department of the Peoples Gas, Light and Coke Co. of Chicago. Mr. Munroe will work under Webster R. Evans, new business manager of this company.

Mr. Munroe is the son of Roy G. Munroe, who is gas new business manager of the Public Service Company of Colorado. His father is a veteran Doherty executive who is well known throughout the organization.

Claude A. Croll, new business manager of the Boyertown Gas & Fuel Co., Boyertown, Pa., for the last 12 years, has resigned and has been succeeded by his former assistant, Earl H. Keim.

Mr. Keim has been connected with the company for seven years and served as assistant to Mr. Croll for the latter half of that period.

D. C. Green, formerly a vice-president of Electric Bond and Share Company, has been elected president of the Middle West Utilities Company, Chicago, Ill. Mr. Green will take complete charge of the operating companies controlled by Middle West Utilities in 18 states.

Mr. Green succeeds Grover C. Neff, who served as president of the system since the receivership. Mr. Neff will resume his former position as president of Wisconsin Power and Light Company, a subsidiary company. Middle West Utilties was formerly headed by Martin Insull.

Ruth Feeney, formerly domestic science instructor in the high schools of Milwaukee, Wisconsin, has been appointed director of the home service department of the Boston Consolidated Gas Company, Boston, Mass.

M. S. Binswanger was elected president of the Memphis National Gas Company, Memphis, Tenn., at the annual meeting of stockholders to succeed O. H. Simonds, who resigned. **John J. Klise** was elected vice-president and **Carl F. Bauman** treasurer. The board of directors was reduced from seven to five members. Mr. Binswanger was re-elected to the board. New directors elected were Mr. Klise, Mr. Bauman, John C. Adams and Marshall Eskridge.

William H. Taylor, president of the Philadelphia Electric Company, and **Conrad N. Lauer,** president of The Philadelphia Gas Works Company, have been elected trustees of the Stevens Institute of Technology, Hoboken, N. J.

Mr. Taylor was graduated from Stevens, one of the oldest technical colleges in this country, in 1902 with the degree of mechanical engineer, while Mr. Lauer received the honorary degree of mechanical engineer in 1930.

J. L. Walker, formerly assistant manager in the Paducah division of the Kentucky Utilities Company, has been transferred to Earlington, having supervision of all plants in the Madisonville, Greenville and Princeton fields.

Jules D. Roberts, vice-president and general manager of the Utah Gas & Coke Company, Salt Lake City, Utah, has been elected a member of the board of directors for the Utah Associated Industries to succeed Lycurgus Fitzpatrick, resigned gas company official.

George H. Scranton, president of the Derby Gas & Electric Co., observed the 50th anniversary of his connection with the utility on August 20th. Mr. Scranton started as a meter reader with the old Derby Gas Co. on September 20, 1833. He was elected president in the fall of 1925, filling the vacancy caused by the death of Charles H. Nettleton.

John F. Weedon, advertising manager of the Peoples Gas Light & Coke Co., Chicago, Ill., has been appointed aide-de-camp on the staff of the Governor of the Commonwealth of Kentucky with the rank and grade of colonel.

Roy B. Leckie, son of Prof. and Mrs. R. B. Leckie, Lafayette, Ind., was recently appointed manager of the Florence Gas Company, Florence, Ala. He is a graduate of Purdue University, where his father is a professor, and obtained his B.S. degree in the chemical engineering school last June.

Robert S. Pride, district manager at Madisonville, Ky., for the Kentucky Utilties Co., has been transferred to the district office in Franklin, Ky. The change is being made, it is understood, by the receivers in Chicago who are anxious that the Franklin district be more rapidly developed.

Obituary

JOHN H. WATERS

John H. Waters, president of the National Radiator Corporation of Johnstown, Pa., passed away at the Emergency Hospital, Washington, D. C., August 14, 1933, after a short illness.

The sudden death of Mr. Waters, at the age of 73, brought to a close a long and active career in industrial, financial and community circles.

Mr. Waters, in 1927, disposed of his interests in the National Radiator Company to a New York syndicate, and the company was dissolved. The assets and business of the company were consolidated by the syndicate with those of five other concerns engaged in the manufacture of heating equipment to form a new corporation under the name of National Radiator Corporation. The main offices were established at Johnstown and Mr. Waters was persuaded to serve as chairman of the board.

In 1930, Mr. Waters was asked by the syndicate to become president of the corporation and to take over active charge of its affairs, which he agreed to do after careful consideration.

Although Mr. Waters was, for a period, not actively engaged in the affairs of National Radiator Corporation, he maintained, at all times, a keen interest in its progress, and gave to the corporation the full benefit of his experience and wisdom. During his many years of service in the industry, Mr. Waters pioneered a

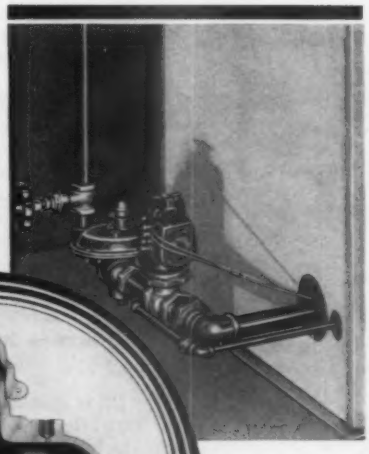
STEADY OUTLET PRESSURE *Insured*

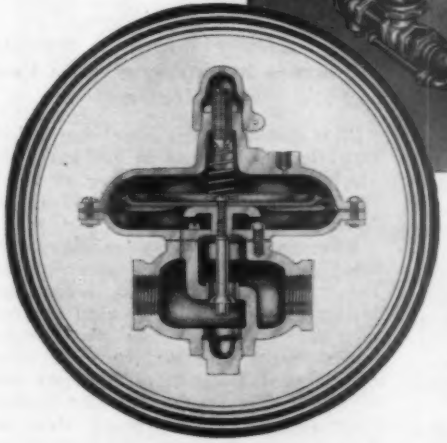
In Low Pressure Gas Regulation, successful operation depends upon the flow of gas at an uniform outlet pressure regardless of varying inlet pressure and volume. Line pressure and volume will vary and unless this is taken into consideration in the design and construction of the gas control unit the outlet pressure will also fluctuate. Reynolds, recognizing this important requirement, has built their low pressure regulator with a balanced valve construction that counteracts the effect of varying line pressure by throwing the control of the valve upon the constant pressure side of the unit. This is also the operating principle of the single valve construction. Its simple design and construction, plus the factory test through a wide range of operating conditions, assure you of satisfactory service and long life.

This unit is particularly adaptable for gas fired equipment using the conversion burner principle. Also, with slight changes, the Reynolds Low Pressure balanced valve regulator is adaptable for atmospheric and vacuum type regulation. For complete information concerning your gas control requirements write direct to Branch Offices, or Representatives.

Right: Reynolds Low Pressure Balanced Valve Regulator used on furnace.

Below: Cross-sectional view of Low Pressure Unit showing Balanced Valve Construction.





NRA MEMBER U.S. WE DO OUR PART

● **REYNOLDS BRANCH OFFICES:** 421 Dwight Building, Kansas City, Mo.; 2nd Unit, Sante Fe Building, Dallas, Tex.
● **REPRESENTATIVES:** Eastern Appliance Co., Boston, Mass. F. E. Newberry, Avon, New Jersey

REYNOLDS GAS REGULATOR COMPANY
Anderson, Indiana, U. S. A.

GAS CONTROL SINCE 1892

Gas Purifying Materials Co. Inc.

Foot of Halsey St, Long Island City, N.Y. — *Branch Yard, Providence R.I.*

Extends its greetings to the members of the International Gas Conference and the American Gas Association.

"A Century of Progress" in gas purification material accomplished in fifteen years of Dependable Service and Scientific Control is the story of

GPM
IRON HYDROXIDE

1. A Super Oxide—a result of extensive research and laboratory control.
2. Impregnated on shavings—does not wash off—
   Every particle in action.
   No inerts.
3. Has met the strictest of laboratory tests and, more important, it will do the same in the boxes.
4. Has the increased activity and capacity required for the added load on the purifiers caused by the modern changes in gas manufacture.
5. Is an AMERICAN product, scientifically made to give the Most Purification for the Dollar.

A Revelation in Purification

Meet Our Representative At the Hotel Stevens, Chicago

number of outstanding improvements in its products and took an active part in the development of standards of trade practice for the betterment of the industry.

In addition to his position as head of the National Radiator Corporation, Mr. Waters was, at the time of his passing away, president of the Century Stove & Mfg. Co. of Johnstown, Pa.

He was president of both the United States National Bank of Johnstown from the time of its inception in 1901, and the Johnstown Trust Company for several years past, as well as president and trustee of the Johnstown Savings Bank and several other banking institutions in nearby communities.

HENRY C. MORRIS

Henry C. Morris, president of the Dallas Gas Company, Dallas, Tex., died on August 17th after an illness of two weeks.

Mr. Morris was known as one of leading natural gas company men in the United States, for many years taking a prominent part in the development of the industry. His advice and counsel were sought by executives of many other companies throughout the country. He was

Henry C. Morris

chiefly responsible for bringing to Dallas its present natural gas service, the change over from manufactured gas twenty-three years ago having been accomplished under his direction. Throughout these years he had given unremitting toil to perfecting this service. His work along this line has resulted in Dallas having a greater percentage of homes using natural gas than perhaps any other city in the country.

The handsome, new eleven-story Dallas Gas building, the largest building in the Southwest devoted exclusively to the natural gas industry, is largely a result of Mr. Morris' activities in making Dallas a center of the natural gas industry in the Southwest.

His activity in the natural gas business included not only the Dallas Gas Company but was national in scope and took in the active direction of a far-flung system of gas companies from Juarez, Mexico to the Pacific Northwest. His supervision included the operations of the Guthrie Gas Service Company, Guthrie, Okla.; the Texas Cities Gas Company, operating in Paris, Brenham, El Paso, Waco, and Galveston; the Fort Worth division of the Lone Star Gas Company; the Juarez Gas Company in Mexico; the Council Bluffs Gas Company in Iowa; and the Northwest Cities Gas Company which includes distribution systems in Walla Walla, Yakima, and Clarkston, Washington; Astoria, Pendleton, and Eugene, Springfield, North Bend, and Marshfield, Oregon, and Lewiston, Idaho.

Mr. Morris always was active and interested in his support of the American Gas Association. At the time of his death he was serving as vice-chairman of the National Directing Committee of Executives, and was a member of the Advisory Council. Formerly he had served as a member of the Executive Board, and as chairman of the Natural Gas Department.

Mr. Morris was born at Detroit, Michigan, in 1879, and educated in public schools of that city. He entered the gas industry in the meter repair shop of the Detroit City Gas Company. Promotions came steadily, and he was made meter shop foreman, then general foreman of street department, and later assistant superintendent of distribution. In 1902 he joined the Saginaw, Michigan Gas Company as superintendent of construction. Three years later he became assistant general manager of the gas company at Bay City, Michigan. In 1909 he went to Dallas, as superintendent of construction and operations of the Dallas Gas Company, and built up the system from 98 miles of pipe line and 8,743 meters to an extensive net work of 765 miles of pipe line serving almost 70,000 meters.

He is survived by his wife, three sons, two brothers and three sisters.

NEWS *of the* GAS INDUSTRY

Utility Safety Problems to Be Discussed

As a feature of the National Safety Congress to be held at Chicago, October 2-6, meetings will be devoted to accident prevention problems of the public utilities.

On Tuesday, October 3, the matter of employee training in safety will be discussed by Dr. Morris S. Viteles, assistant professor of psychology, University of Pennsylvania, and director of personnel research, Philadelphia Electric Company, Philadelphia; Professor S. N. Stevens, Northwestern University, and F. M. Pepper, general plant employment superintendent, Illinois Bell Telephone Company, Chicago.

On Wednesday, October 4, the physical plant from the safety standpoint will be analysed by such outstanding men as W. R. Smith, assistant chief engineer, United Engineers and Constructors, Inc., Newark, New Jersey; C. R. Beardsley, assistant superintendent of distribution, Brooklyn Edison Company, Brooklyn, New York; and W. A. Buchanan, Appalachian Electric Power Co., Welch, West Virginia.

New York Offices of General Electric Moved

The General Electric Company and four of its associated companies have announced the removal of their offices in New York City to the new General Electric Building, 570 Lexington Avenue at 51st Street. Included are the executive offices, New York district office, air conditioning department, electric refrigeration department, Atlantic division of the Incandescent Lamp Department, Merchandise Department, and Plastics Department of the General Electric Company, and the General Electric Contracts Corporation, G. E. Employees Securities Corporation, General Electric Realty Corporation, and International General Electric Company, Inc. New York City headquarters were formerly at 120 Broadway.

Independence Company Showing Increase in Customers for Past 6 Months

That conditions are improving is indicated by the increase in customers that has been made in the past few months by the Jackson County Light, Heat and Power Co., at Independence, Mo.

The Jackson County company, like other gas companies and other utilities, showed a considerable loss in customers last year and extending up until February of 1933. Since that time this company has shown a gain in meters and since February of this year 120 meters have been added to the lines of the Jackson County company. Many of these are former customers who, because of unemployment and other conditions, were forced to discontinue service.

The greatest number of meters this company had on the lines was 5,902 in May, 1932. From that time until February, 1933, approximately 300 customers were lost. In February, this year, there were total meters of 5,615 on the lines while the last report, in July, 1933, showed

(Continued on page 82)

Gas Distribution and Street Department Supplies

GOODMAN STOPPER

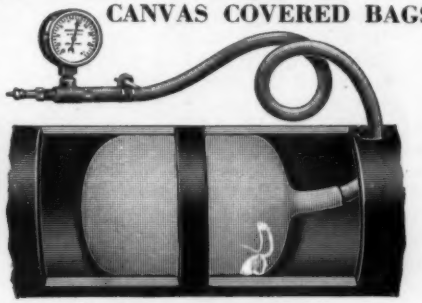
Patented

DEPENDABLE GAS MAIN BAGS

4 TYPES
Sizes—2" to 48"

Plain Rubber—
light weight, Type "A"
medium weight, Type "B"
heavy, extra strong, Type "D"
Canvas-Covered, Type "C"

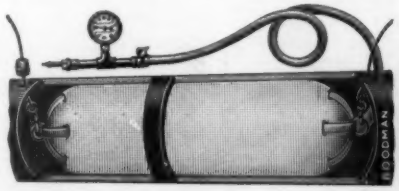
CANVAS COVERED BAGS



GOODMAN-PEDEN STOPPER

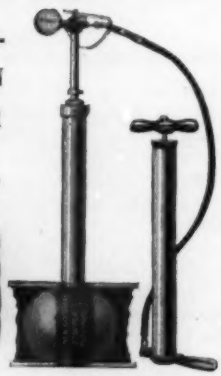
Patent Pending

GOODMAN CYLINDRICAL STOPPER FOR INTERMEDIATE PRESSURES



Patented

GARDNER-GOODMAN STOPPER

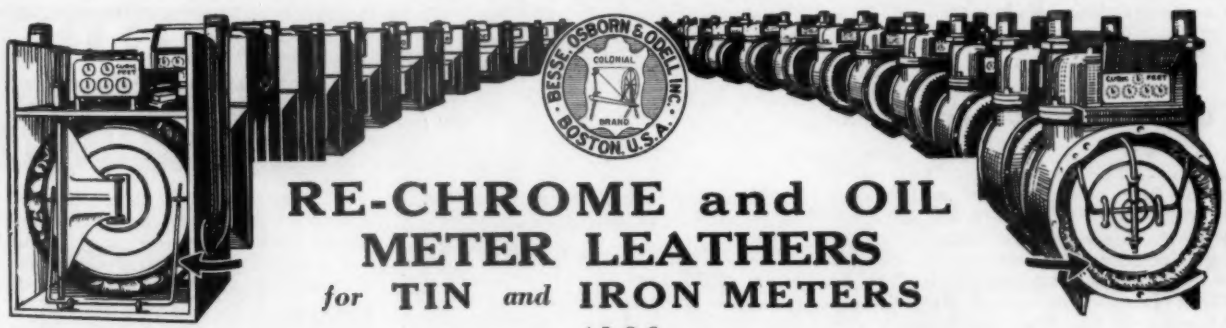


Patented

SAFETY GAS MAIN STOPPER CO.

523 Atlantic Avenue, Brooklyn, N. Y. Cable Address: Gastopper, New York

Pac. Coast Rep.: C. B. Babcock Co., 135 Bluxome Street, San Francisco, California
New England Rep.: Eastern Appliance Co., 250 Stuart St., Boston, Mass.



RE-CHROME and OIL METER LEATHERS

for **TIN** *and* **IRON METERS**

ALSO

FOR REGULATORS *and* GOVERNORS

Our Re-Chrome Tannage will successfully stand the five minute boiling test. This leather has passed the experimental stage and is now in general use by most of the leading gas companies.

Actual service tests have been going on for more than seven years under all operating conditions and the results show that Re-Chrome Leather insures longer life and lower repair costs than any other leathers.

BESSE, OSBORN & ODELL, Inc., 51 South St. Boston, Mass.

Tanners of "COLONIAL" Meter Leather

N. Y. Representatives—G. N. Bankart & W. A. Smith, 177 William St., N. Y. City

(Continued from page 80)

5,735. The gain has been regular since February. In March 21 new customers were added, making the total 5,636; in April, 31, bringing the total to 5,667; in May, 37, bringing the total to 5,704; in June, 9, making the total 5,713, and in July, 22, making the total 5,735.

Part of the increase in the number of customers is due to the activity of the company in reviving dead services. All of that company's employees are concentrating on adding customers by reviving dead service lines, according to L. L. Garner, manager.

Gas for Heating Down to 50 Cents

New rate schedules providing a rate of 50 cents per thousand cubic feet for gas used in excess of 20,000 cubic feet per month have been filed by Allentown-Bethlehem Gas Company, Chester County Light and Power Company, Consumers Gas Company, Delaware Power & Light Company, The Harrisburg Gas Company, Lebanon Valley Gas Company, Philadelphia Electric Company and The Philadelphia Gas Works Company.

This lowered rate, designed primarily to promote a more widespread use of gas for house heating, became effective in July in Allentown-Bethlehem, Reading, Delaware, Harrisburg, Lebanon and Philadelphia Electric territory; became effective in August in Chester County; and in Philadelphia in September.

Gas Well Activities in Indiana

Gas well activities in seven Indiana counties, includes two gas wells with open flow production of more than 1,000,000 feet, have been reported by Paul F. Simpson, State Geologist. Drillings included: Daviess county—Amsler & Gilmore drilling on the Arthur B. Clark farm. Drilling of the William Moore well No. 2 by the Triangle Oil & Gas Co., in the same locality has been completed at 701 feet with an open flow production of 1,100,000 feet. In Delaware county a small gas well was brought in by W. P. Grossman. In Jay county N. E. Masters has completed a 1,000,000 foot well on the Stoner lease in Wayne township and has moved to another location nearby where a well is being completed. A good gas well has been reported by Thayer & Lloyd in Knox county. Knapp & Woods are drilling their second well on the right of way of the Southern Indiana Gas & Electric Co., in Vanderburgh county.

Legislature Declines to Regulate Gas Rates

The Massachusetts Senate has rejected a bill to regulate the price of gas in the Hyde Park district of Boston, in Dedham and in part of Westwood.

New York Housewives Visit "Kitchen on Wheels" to View Latest Labor-Saving Aids

In the course of a week 1,000 Bronx housewives visited a "kitchen on wheels" to see actual cooking going on and to witness other operations of up-to-date gas appliances, including the new air-cooled Electrolux refrigerator which was one of the main attractions of the exhibit.

The demonstration was carried on as an educational project under the auspices of the Consolidated Gas Company of New York in co-operation with neighboring dealers and gas offices. Two Electrolux refrigerators were in operation in the traveling kitchen. All the appliances were supplied with gas from tanks stored on the truck.

The kitchen was twenty-five feet long and about eight feet wide and mounted on an automobile that moved from point to point in one of New York City's largest residential sections. Each side of the "kitchen" bore the following legend in large letters: "See Them Work! Air-Cooled Gas Refrigeration." Attendants on the sidewalk invited passersby to "walk right in."

Two young women attendants inside answered innumerable questions about the various appliances. One of the young women, a home economics graduate showed visitors among other things how useful the gas refrigerator is in keeping dough in good condition.

The advantage of having the dough handy in the refrigerator and ready for the oven was practically demonstrated on the truck. The dough was taken from the refrigerator from time to time, rolled out and placed in the oven in sight of visitors. When the cookies were baked samples were handed out.

New Gas Company Formed in Baltimore

The Prince George's Gas Corp., Baltimore, Md., has been incorporated by Stuart S. Janney, Baltimore Trust Building, Baltimore, Norwood B. Orrick and Joseph France, also of Baltimore.

Counter Plan for Operation of Mobile Gas Company Submitted

A counter plan for the operation of the Mobile Gas Company now in bankruptcy has been submitted by the bondholders protective committee to the Alabama Public Service Commission. This committee proposes to buy in the property at foreclosure sale, issue one share of common stock for each $100 in present bonds held, to the holders of the security, elect a board of directors and take over active management of the utility.

The committee finds fault with a plan of reorganization submitted by the Mobile Gas Service Corporation, a subsidiary of the Consolidated Electric & Gas Company on which a hearing was held by the Public Service Commission, July 28.

"We do not believe the local unit can be profitably operated for both the bondholders and the holding company," said the letter of transmittal to the Public Service Commission. "We therefore propose to eliminate the bonding company."

In its plan of reorganization, the bondholders protective committee proposes to issue $1,900,000 in bonds to present holders, $1,392,000 maturing Oct. 1, 1951, bearing 3½ per cent interest until Oct. 1, 1936 and then 5 per cent interest until maturity and $507,800 of bonds maturing Oct. 1, 1960, bearing 3 per cent interest until Oct. 1, 1936 and then 5 per cent until maturity.

Natural Gas Service Planned

If the necessary franchises are granted, Leo A. Wilson of Sarnia, Ontario, and his associates will build a natural gas pipe line from the Lambton gas fields to Kitchener, Ontario.

Gas Company Makes Roundup on Old Stoves

The Alabama Utilities Service Company of Montgomery, Ala., is conducting its "Fifth Annual Old Stove Roundup." A trade-in allowance on old stoves of $13.15 is applied on the purchase of a new heat control model. The company offers to haul away the old stove and install the new range. The appeal of "Buy Now Before Prices Advance" is being successfully used and sales are running far ahead of last year.

Southern Gas Association

Announcement has been made by B. B. Ferguson, president of the Southern Gas Association, of the appointment of new committees to carry on the important work of the association for 1933-1934. The committee members, who are chosen because of their outstanding ability and experience, are responsible for the major portion of the work undertaken by the Association during the year.

Following are the appointments to the various committees:

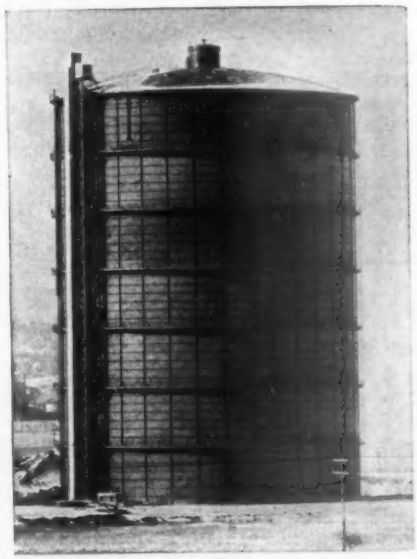
Commercial Section—W. A. Hudson, Chairman, W. D. Adams, Vice-Chairman, E. M. Cannon, H. S. Dossell, John C. Dyer, Stanley Grady, W. A. Melton, E. J. McGlinchey, J. A. McIntosh, E. G. Peabody.

Technical Section—David P. Allen, Chairman, C. L. Nairne, Vice-Chairman, M. N. Bailey, C. F. Carter, B. H. Elliott, W. P. Hutchinson, Henry Jones.

Industrial Section—O. F. Reynolds, Chairman, A. M. Spencer, Vice-Chairman, F. J. Evans, P. F. Hoots, L. S. Regan.

Natural Gas Service Promised

The Central Michigan Natural Gas Corporation is planning to build a natural gas pipe line from the Mount Pleasant field into the city of Lansing, Michigan, and supply that place with natural gas. It will call for an outlay of more than $85,000.



If you want the truth about the
STACEY-KLONNE HOLDER
"Ask the Man who owns one"
(With apologies to Packard)

STACEY BROS.
GAS CONSTRUCTION COMPANY
CINCINNATI OHIO

"CHACE has given perfect satisfaction for 5 Years"

CENTRAL SCIENTIFIC COMPANY

Another Exclusive User

TRADE MARK CENCO REG. U.S. PAT. OFF.

Many leading manufacturers now use Chace Bimetal because of its high sensitivity, accuracy constant uniformity and dependable operation under all conditions . . . . . .
SHEETS—STRIPS—FORMS

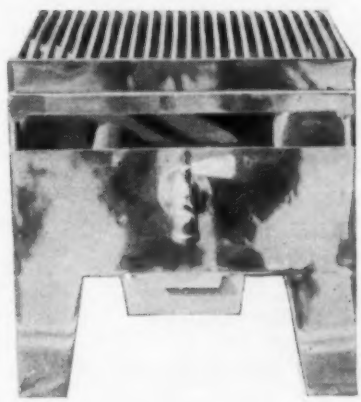
CHACE THERMOSTATIC BIMETAL
"It Bends with the Heat"

W. M. CHACE VALVE CO.
1610 Beard Avenue . . Detroit Mich

Correct Broiling

with the

INSTANT RADIANT GRILL



If you like real nice juicy tender steaks, with all the aroma of a smoky charred taste just like over a real open fire, then try the Instant Radiant Grill.

If you don't like pork chops, try one done on the Instant Radiant Grill. All the grease from the fat of the chop drips away, and when you eat the lean of the meat it is not greasy but is sweet and tender, with all the flavor retained.

It is uncanny and you will not believe it until you have tried it. Light up an Instant Radiant Grill, put the meat on at once. No waiting to get the grill hot but you will have a nice juicy tender steak done to perfection in five minutes from the time you light the match.

Instant Radiant Grill is simplicity itself. No radiants to break, no fire brick or refractory substance to fuss with or replace, no air shutter to adjust or clog up, no bunsen tube to cause flash back, no complicated parts. You simply light it up and turn it out when not in use.

Entirely made of cast aluminum, highly polished.

An all-the-year-round load builder and PRICED RIGHT.

Write for descriptive booklet.

Radiantlog Corporation

10 Chelsea Place, E. Orange, N. J.

Lone Star Gas System Again Wins First Place in Ad Contest

For the third consecutive year, the Lone Star Gas System, with headquarters in Dallas, Texas, has won first prize in a national advertising copy contest among the major gas companies of the country.

The Public Utilities Advertising Association, which conducts the "Better Copy Contest," at its annual meeting in Grand Rapids, Mich., announced that an ad entitled "Natural Gas Is Your Lowest Priced Domestic Servant," had been judged the best piece of copy among all advertising placed in newspapers by gas companies of the United States in the year 1932.

The prize winning ad appeared in more than 200 Texas and Oklahoma newspapers in February last year. Copy was prepared by Willard G. Wiegel, assistant advertising manager of the Lone Star Gas System which includes the Community Natural, Municipal, Texas Cities, Stamford and Western, Dallas and Lone Star gas companies. Will C. Grant is manager of the advertising department. This company also won first prize last year in the same contest with an ad written by Mr. Wiegel and received first honors also in 1931.

The Consolidated Gas Company of New York, captured second place in the gas newspaper advertising division of the "Better Copy Contest," while the Pittsfield Coal Gas Company, Pittsfield, Mass., received honorable mention.

In the gas window display division, awards were made as follows:

Kings County Lighting Co., Brooklyn, N. Y., first prize; Consolidated Gas Company of New York, second prize; Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y., honorable mention.

Fifteen of the twenty-four awards made were for utility newspaper advertisements. This covered the field of gas, electricity and street railways.

A. G. A. Kitchen Planning Handbook Is Ready

The American Gas Association has recently issued "Modern Kitchens—a Handbook for Design and Construction," compiled and edited by Mrs. Virginia Hart, an architect with experience in kitchen planning. This book is intended for home service workers and others who are doing kitchen planning work; it is not planned for the consumer's use. Kitchen plans with specific reference to the placing of equipment—especially gas equipment—constitute the subject of the book. Names of companies manufacturing essential equipment are listed together with a summary of the relative advantages of various types of fixtures and furnishings. The cost of the book is $3.00 per copy. It is obtainable at American Gas Association headquarters, 420 Lexington Ave, N. Y. C.

Plans Mixed Gas for Minneapolis

The Minneapolis Gas Light Co., Minneapolis, Minn., has notified the Minneapolis City Council that it will be able to supply natural gas or a mixture of manufactured and natural gas to its customers beginning October 1, at a price considerably less than the present rate for manufactured gas.

Officers of the company said that natural gas will reach Minneapolis from Texas by the Northern Natural Gas Co., whose pipe line reaches as far north as Owatonna, Minn., sixty miles south of Minneapolis.

Gas Company Offers Ten Per Cent Reduction in Rates

A reduction of ten per cent in residential gas rates and 21 per cent in commercial rates has been offered the city council at Peru, Ind., by Glenn Hoss, Peru district manager of the Northern Indiana Public Service Company. The offer has been taken under consideration. Mr. Hoss said it was planned to change from the present 570 BTU gas to a richer gas containing 1,000 units a cubic foot. The same proposal has been presented to the city councils of Logansport, Winamic and Wabash. The cost of the change to the richer gas would be borne by the company, officials said, and every gas-burning appliance in the entire territory would be adjusted without cost to the consumer.

Gulf Refining Appoints Assistant District Sales Manager for New England

Geo. H. Wight was recently appointed assistant district sales manager in charge of lubrication sales in the New England territory of the Gulf Refining Co. He assumes his new connection immediately.

According to the announcement, Mr. Wight will have charge of both automotive and industrial lubrication sales for Gulf. His territory will include all of New England with the exception of the southern portion of Connecticut. He will make his headquarters at the Gulf Refining Company's offices in Boston at 31 St. James Avenue.

New Gas Company Formed in Kentucky

Articles of incorporation of the North Middletown Gas Co. have been filed in the offices of the Secretary of State of Kentucky, at Frankfort. The new company will take over the Clintonville and North Middletown gas line that has for several years furnished gas to both towns. The incorporators are: Senator H. S. Caywood, D. R. Summay, Robert M. Gilkey, William Jones and Thomas C. Prewitt.

Convention Calendar

October

2-6 National Safety Congress Chicago, Ill.

10–13 National Association of Railroad & Utilities Commissioners Cincinnati, O.

20 New England Gas Association Operating Division,, Worcester, Mass. D. C. Campbell, Secretary, Operating Division.

24–26 American Petroleum Institute Chicago, Ill.

Special Election on Public Ownership of Electric and Gas Utilities Requested

The Consumers' League of New Albany, Ind., has filed a petition asking the city council to call a special election on the public ownership of electric and gas utilities there. Purchase of the property of the Public Service Company of Indiana is asked for the city distribution of gas, electric and water service. The petition is the second of the league, the first being declared invalid by the city legal department.

A.G.A. Members Named NIRA Committeemen

Executives of manufacturer member companies of the American Gas Association appointed by the Secretary of the Interior as members of committees operating under the National Industrial Recovery Act are as follows:

Thomas J. Watson, president, International Business Machines Corporation, New York; Committee on International Trade Relations.

James H. Rand, Jr., president, Remington Rand, Inc., New York; Sub-committee on Fees for Departmental Services.

New Course Arranged for Engineers

The Extension Division of Brooklyn College, Broklyn, N. Y., announces that, beginning September 29, it will offer a new course in "The Principles of Electrochemistry and Photochemistry."

This course will consider the principles underlying electrochemical and photochemical processes used in industries, together with methods of manufacturing representative products. The course has been arranged for chemists, engineers, and technical employees, and for teachers of science in the New York City high schools.

Applications for admission and further information may be obtained by addressing Professor Joseph G. Cohen, Director of the Extension Division, Brooklyn College, 383 Pearl Street, Brooklyn, N. Y.

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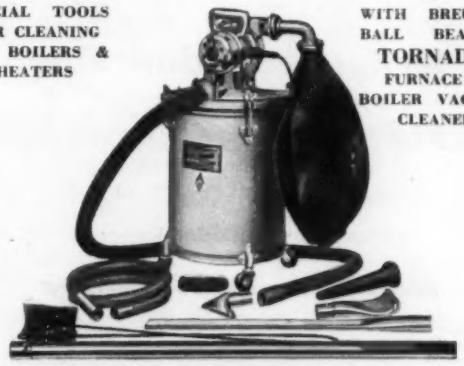

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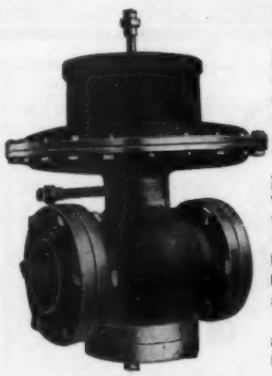

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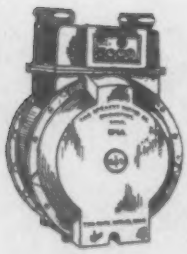

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